

## **Appendices - *DRAFT 7-28-03***



## **Appendix A**

### **Moses Lake Flow Report, EMTS Stream Hydrology Unit**





# Moses Lake Inflow-Outflow Balance – A Component of the Moses Lake Total Phosphorus Total Maximum Daily Load

## Abstract

Between September 2000 and November 2001, Washington State Department of Ecology (Ecology) measured discharge and developed continuous stage records on Rocky Ford Creek and Rocky Coulee Wasteway, tributaries to Moses Lake in Washington State. In addition, Ecology performed a synoptic flow study on Rocky Ford Creek and took a series of discharge measurements at the South Outlet of Moses Lake (USBR Site 07). Measurements at the South Outlet included both Acoustic Doppler Current Profiler (ADCP) measurements and instream measurements within the control structure.

Monitoring supported a Total Phosphorus Total Maximum Daily Load (TMDL) Study developed by Ecology. The study assessed the assimilative capacity of Moses Lake with respect to the in-lake total phosphorus (TP) criterion of 50 ug/L (Carroll, 2001). Calculation of lake inflows and outflows allowed the determination of lake TP maximum loading.

Seven to eight instream flow measurements were taken at both continuous recorder stations. Rating equations were developed by relating discharge to stage. United States Geological Survey (USGS) records were used to determine discharge from Crab Creek. Standard hydraulic equations were used to calculate discharge from the gated control structures at both the North Culvert and the South Outlet (USBR Site 07) of Moses Lake. The maximum flow of Rocky Coulee Wasteway was just above 2300 cfs, and the minimum flow was 8.5 cfs.

The maximum flow at Rocky Ford Creek was 94 cfs, and the minimum was 33 cfs. A low-flow rating and a high-flow rating, based on eight instream measurements, were developed for the Rocky Coulee Wasteway site. Based on polynomial regression analysis, both ratings produced an  $r^2$  of 0.99. The polynomial rating equation for Rocky Ford Creek, based on five instream measurements, also produced an  $r^2$  of 0.99.

The average total inflow to Moses Lake via Rocky Ford Creek, Rocky Coulee Wasteway, and Crab Creek was 452 cfs during wateryear 2000-2001. The outflow through the North Culvert and the South Outlet averaged 536 cfs. The estimated outflow exceeded the measured inflow by 84 cfs. This difference can be attributed to unmeasured inflow from minor streams, groundwater inflow, and errors in the calculations.

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## Introduction

Between September 2000 and November 2001, the Stream Hydrology Unit (SHU) of the Washington State Department of Ecology (Ecology) measured discharge and developed continuous stage records on Rocky Ford Creek and Rocky Coulee Wasteway, tributaries to Moses Lake in Washington State. In addition, SHU performed a synoptic flow study on Rocky Ford Creek. Streamflow of Rocky Ford Creek, Rocky Coulee Wasteway, and Crab Creek comprise the major inflow to Moses Lake. Outflow from the lake is via the North Culvert gates and the South Outlet gates. SHU also made a series of discharge measurements at the South Outlet of Moses Lake (USBR Site 07), and estimated outflow from the lake at both the North Culvert and South Outlet using USBR lake level data and the positions of the controlling gates.

Monitoring supported a Phosphorus Total Maximum Daily Load (TMDL) Study developed by the Watershed Ecology Section of Ecology. The study assessed the assimilative capacity of Moses Lake with respect to the in-lake total phosphorus (TP) criterion of 50 ug/L (Carroll, 2001). Calculation of lake-inflows and outflows allowed the determination of lake TP maximum loading.

## Sites

SHU established continuous stage height recording stations at Rocky Coulee Wasteway and Rocky Ford Creek. The remaining discharge data were gathered from existing United States Geological Survey (USGS) and United States Bureau of Reclamation (USBR) monitoring stations.

- The Rocky Coulee Wasteway site was located on the left edge of water on the downstream side of the K Road bridge at 4° 09' 38"N longitude and 119° 27' 09"W latitude, just upstream from the confluence with Crab Creek.
- The Rocky Ford Creek station was located below the check dam along the left edge of water between Hwy 17 and the mouth of the creek (47° 14' 38"N longitude, 119° 27' 025"W latitude).
- Data for Crab Creek was gathered from the USGS station (#12467000) located at the Road 7 bridge (47° 11' 22"N, 119° 15' 52"W), above the confluence with Rocky Coulee Wasteway.
- Discharge from Moses Lake was calculated using lake elevation and gate data from the USBR station in the South Outlet forebay (USBR Site 07 at 47° 04' 48"N, 119° 19' 57"W) and the elevation data for the Potholes reservoir.

## Methods

The two streamflow stations were equipped with a pressure transducer and a datalogger that recorded stage height at 15 minute intervals from September 2000 to November 2001. The dataloggers used by SHU are Design Analysis H-510's with H-310 SDI-12 pressure transducers. These transducers are factory set for depths of 0 to 34 ft. Daily average discharge at each station was calculated from rating curves comprised of six to eight wading measurements.

Discharge measurements followed the USGS mid-section method (USBR, 1997). The measured cross-sections, perpendicular to the stream flow, were established by driving re-bar into opposing banks. This allowed field staff to return to the same cross-section at different stage heights and improved the reliability of the measured discharge. In the case of Rocky Coulee Wasteway, high-flows were measured from a bridge. In general, the cross-sections were divided into approximately 20 cells so that no more than 5% to 10% of the total discharge passed through any single cell. The width of the individual cells varied in keeping with the 5% to 10% discharge criteria. Velocity measurements were taken at 0.6 times the stream depth when the total stream depth was less than 1.5 ft. and at 0.2 and 0.8 times the stream depth when the depth was greater than 1.5 ft (Hopkins, 1999). The instream velocity measurements were made with a standard USGS top set wading rod fitted for Swoffer type optical sensors and propellers or standard bridge measurement equipment. Stream discharge was calculated from field notes using an in-house software program. Continuous stage records were converted to discharge in cubic feet per second (cfs) using rating equations developed from the instream measurements.

The outflow of Moses Lake into Potholes reservoir was estimated using four methods; one for each of the four outflow regimes common to the operation of the radial gates:

1. Under the most common conditions, the gates are lowered below the elevation of Moses Lake and control the lake outflow into Potholes reservoir. Usually, the elevation of Potholes reservoir is low enough that it does not restrict the outflow from the gates. Under this regime the gate-orifice equation recommended by the US Bureau of Reclamation was used. The equation is:

$$Q=c \cdot V \cdot A$$

where:

Q=discharge, cfs

V=velocity, fps

A=area, sq ft. (gate width times gate opening)

c=coefficient of discharge - value used was 0.65

Velocity was estimated as the square root of  $(2gH)$  where  $g$  is the acceleration of gravity (32.174 ft./sec sq) and  $H$  is the head. The head was estimated as the distance from the water surface (Moses Lake Elevation) to the center of the gate opening.

2. Another regime occurred when the gates were controlling outflow to Potholes reservoir but the elevation of the Potholes reservoir was above the sill elevation of the gates

(1041.30 ft.). At this point the outflow from Moses Lake was impeded and the head (H) was estimated as the difference in elevation between Moses Lake and the Potholes reservoir. The same equation was used as in the first regime with the substitution of a different H value.

3. A third regime occurred regularly when the gates were raised completely out of the water and flow was no longer controlled by an orifice. During these conditions, we used the standard Manning's equation with a roughness (n) of 0.014 to estimate velocity. The slope length was fixed at 33 ft., the length of the confining channel, and the elevation decrease was estimated as the difference between the Moses Lake elevation and the sill elevation of 1041.3 ft. The area was estimated as the gate width times the depth of water over the sill (Moses Lake elevation minus the sill elevation).

$$v = 1.486/n R^{0.67} S^{0.5}$$

where:

v = velocity

n = Manning's n

R = hydraulic radius

S = slope

$$\text{Discharge or } Q = v * \text{Area}$$

4. A fourth regime was a modification of the third regime and occurred when the elevation of the Potholes reservoir exceeded the sill elevation and began to impede the free outflow of water from Moses Lake. In this case, the same Manning's equation was used except the elevation decrease was estimated as the difference between the Moses Lake elevation and the Potholes reservoir elevation.

Discharge was estimated individually for each of the five gates and the results summed for total outflow. Two ADCP measurements were made below the fore bay of the South Outlet and several velocity measurements taken within the gated structures. These were used to verify the outflow estimates.

The outflow at the single Moses Lake Irrigation and Rehabilitation (MLIRD) outlet was estimated using the gate-orifice equation as in regime 1 and 2 above. Throughout the study period, the gate opening was fixed at one foot, and the area of flow was three square feet. When the elevation of Potholes reservoir did not impede the outflow, the head (H) was estimated as the difference between the Moses Lake elevation and the culvert base elevation (1040.76 ft.). When the elevation of Potholes reservoir was above the culvert base elevation, head (H) was estimated as the difference in elevation between Moses Lake and the Potholes reservoir.

## **Quality Assurance**

The quality of this study relied primarily on the accuracy of the field measurements and the care and operation of the instruments.

### **Discharge Measurements**

Because the largest potential source of error involved with a discharge measurement is in the velocity measurement itself, site selection and equipment calibration are of high importance. In this study, the measured cross-sections were rated between good and fair. Based on physical conditions encountered at each site, a good cross-section assumes an error of up to 5% and a fair cross-section assumes an error of up to 8%. Depending on the selected cross-section, a minimum of the assigned error is assumed and carried forward to the final discharge calculation. An additional source of error in velocity measurements is the calibration of the Swoffer instruments. The ideal calibration value of a Swoffer propeller is 186. The Swoffer propellers used during this project were pre and post calibrated with values ranging from 186 to 182. A calibration rating of 186 means that for every 186 revolutions of the propeller, 10 ft.of water have passed the measurement point. A calibration value of 182 underestimates the discharge measurement by 2%. Once a rating curve was established, discharge measurement accuracy was tracked by comparing the measured discharge values to the predicted discharge values at the same stage. The range of difference between the measured and predicted discharge fell within the assumed variation in the measured cross-sections. The combination of propeller variations, poor cross-sections, and low-flow conditions contributed to the measured and predicted discharge differences ranging from less than 1% to just over 15%.

### **Pressure Transducers/ Staff Gages**

Based on manufacture specifications, the theoretical precision of the pressure transducers is less than or equal to 0.02% of the full-scale output. For the transducers used by SHU, this precision is considered linear from 0 to15 psi or 0 to 34.6 ft. During the study period, the accuracy of each probe was addressed by using staff gage versus transducer regressions. The  $r^2$  values for the regressions of discharge against staff gage readings ranged from 0.96 to 0.99.

## **Results**

Results are presented separately for each of the three major inflows to Moses Lake, and the two outflow locations.

### **Rocky Coulee Wasteway**

The continuous record for Rocky Coulee Wasteway encompasses wateryear 2001, from September 7, 2000 to October 28, 2001. During this period there were three instances when the recorder failed. These data gaps were filled by interpolating data from USBR gage # 29

upstream from the Ecology gage. The maximum flow measured at Rocky Coulee Wasteway was 2084 cfs and the minimum measured flow was 13 cfs. A low-flow curve and a high-flow curve, based on 8 instream measurements, were developed for the Rocky Coulee Wasteway site. Based on polynomial regression analysis, both curves produced an  $r^2$  of 0.99.

The average flow during the 2000-20001 wateryear was 365 cfs. The maximum daily flow was 2274 cfs and the minimum was 8cfs. Daily discharge values are included in Appendix A.

### **Rocky Ford Creek**

The continuous record for Rocky Ford Creek runs from September 6, 2000 to October 30, 2001, encompassing all of wateryear 2001. During the study period there was one instance when the recorder failed to log. Because of the relative stability of the discharge record, this data gap was filled with a linear interpolation between the start and end points of the gap. The polynomial rating equation for Rocky Ford Creek, based on 5 instream measurements, produced an  $r^2$  of 0.99. The maximum measured flow at Rocky Ford Creek was 90 cfs and the minimum measured flow was 34 cfs. The predicted maximum flow was 94 cfs and the predicted minimum flow was 33 cfs.

The average flow during the 2000-2001 wateryear was 61cfs . The maximum daily flow was 93 cfs and the minimum was 34 cfs. Daily discharge values are included in Appendix B.

In addition to developing a rating curve near the mouth of Rocky Ford Creek, SHU measured flow at five upstream sites for a synoptic flow study. The gauging station located at the mouth of Rocky Ford Creek was used as a reference point during the study period. Site descriptions and results can be found in Appendix C.

### **Crab Creek**

Discharge for Crab Creek was determined from USGS records. Daily discharge values are included in Appendix D. The maximum flow was 54 cfs and the minimum flow was 6.3 cfs. The average flow during wateryear 2000-2001 was 26 cfs.

### **South Outlet and North Culvert**

A series of discharge measurements were taken in the South Outlet structure of Moses Lake (USBR site #7). In addition to these measurements three Acoustic Doppler measurements were made downstream from the structure. The average outflow from the South Outlet during the 2000-2001 wateryear was 508 cfs, with daily flow ranging from 12 to 2141 cfs. During wateryear 2000-2001, the average outflow through the North Culvert was 28 cfs, ranging from 8 to 37 cfs. The estimated daily outflow from the South Outlet and the North Culvert are presented in Appendices E and F, respectively.

## **Summary**

The total inflow to Moses Lake via Rocky Ford Creek, Rocky Coulee Wasteway, and Crab Creek averaged 452 cfs during wateryear 2000-2001. The outflow through the North Culvert and the South Outlet averaged 536 cfs. The estimated outflow exceeded the measured inflow by 84 cfs. This difference can be attributed to unmeasured inflow from minor streams, ground-water inflow, and errors in the calculations. The majority is probably ground-water inflow to Moses Lake.

## **References**

- Carroll, Jim, 2001. *Moses Lake Total Phosphorus Total Maximum Daily Load, Quality Assurance Project Plan*. Washington State Department of Ecology, Olympia, Washington.
- Hopkins, Brad, 1999. Determination of Instantaneous Flow Measurements on Rivers and Streams: Washington State Department of Ecology, Olympia, Washington. Draft Paper. 6p.
- United States Bureau of Reclamation, 1997. *Water Measurement Manual*. U.S.G.P.O., Denver, Colorado.

**Appendix A**  
**Ecology 2000-2001 Rocky Coulee Wasteway Mean Daily Discharge (cfs)**

Day	Ecology 2000-2001 Rocky Coulee Wasteway Daily Discharge Averages (cfs)														
	Sept	Oct	Nov	c	n	De	Ja	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	-	49	91	23	17	14	13	2238	641	1091	82	66	1107	250	
2	-	50	88	24	17	14	13	2143	578	1100	81	66	1207	236	
3	-	50	86	21	17	14	12	2049	471	1100	86	67	1212	167	
4	-	47	73	22	17	14	12	2021	321	1009	83	68	1202	135	
5	-	49	49	24	17	14	12	1745	299	780	80	67	1210	219	
6	-	64	41	22	15	14	12	1528	238	552	84	63	1174	431	
7	59	49	33	22	15	13	12	1292	106	326	89	60	1016	661	
8	56	50	35	23	15	14	12	1169	23	84	83	72	1057	648	
9	53	51	33	20	15	13	12	1074	162	11	81	64	1063	694	
10	54	49	30	23	15	13	12	1097	315	11	81	66	1098	746	
11	54	49	29	22	15	13	12	1213	395	11	81	69	890	647	
12	55	50	29	21	15	13	12	1250	357	14	81	68	746	620	
13	51	47	31	20	15	13	12	1587	433	11	82	198	608	657	
14	52	46	28	19	15	13	12	1668	426	11	83	608	614	662	
15	51	50	29	20	15	13	12	1788	260	8	84	838	644	543	
16	49	45	31	20	15	13	12	1879	147	8	85	1052	640	457	
17	49	47	30	19	15	13	12	1594	35	8	85	1223	692	372	
18	49	47	27	18	15	13	12	1454	37	8	85	1261	880	307	
19	47	48	25	19	15	13	12	1332	35	11	86	1236	990	148	
20	47	48	27	18	15	13	12	1208	37	15	75	1235	983	123	
21	48	53	26	19	15	13	25	1171	49	61	71	1197	1018	109	
22	47	49	24	18	15	14	274	1130	245	467	73	1159	956	86	
23	48	53	26	18	15	14	565	936	617	933	67	1047	962	28	
24	51	944	25	18	15	14	1028	843	958	943	65	660	834	28	
25	47	1042	26	18	14	13	1174	533	1176	616	63	543	713	28	
26	47	1029	26	18	14	13	1281	345	1195	432	63	598	803	29	
27	47	984	23	18	14	13	1756	384	1177	214	64	566	849	28	
28	47	460	25	17	14	13	2145	493	1082	166	62	558	702	27	
29	51	178	23	18	14	-	2101	529	1085	157	64	680	464	28	
30	49	153	25	18	14	-	2224	549	1089	109	65	759	255	-	
31	-	118	-	18	14	-	2274	-	1081	-	67	883	-	-	
	50	195	36	20	15	13	487	1275	486	342	77	551	886	314	
														339	

Estimated from USBR gauge

Average discharge for wateryear 2000-2001 = 365 cfs

**Appendix B**  
**Rocky Ford Creek Daily Discharge Averages 2000-2001**

Day	Rocky Ford Creek Daily Discharge Averages 2000-2001													
	Sept	Oct	Nov	c	n	De Feb	Ja Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
1	-	90	85	75	59	49	41	38	36.6j	52	62	71.8j	77	81
2	-	90	85	75	59	49	41	39	36.7j	52	62	72.2j	79	81
3	-	91	85	74	58	49	41	38	36.9j	51	63	72.6j	78	81
4	-	89	85	73	58	49	41	38	37j	52	63	73j	78	81
5	-	89	85	73	57	49	40	37	37.2j	52	63	73.3j	78	81
6	-	88	84	72	57	49	40	37	37.4j	54	63	73.7j	78	80
7	89	88	84	71	56	48.6j	40	37	37.5j	54	63	74.1j	78	81
8	91	88	84	72	55	48.5j	41	37	37.7j	54	64	74	78	81
9	91	88	85	71	54	48.4j	42	37	37.8j	55	64	74	78	81
10	91	88	85	70	54	48.3j	41	36	38j	55	64	74	79	81
11	91	88	83	69	53	48.2j	40	36	38.2j	57	64.1j	75	80	81
12	92	88	82	67	53	48.1j	40	38	38.3j	57	64.4j	75	79	81
13	93	88	82	65	53	48.0j	40	34	38.5j	58	64.8j	75	80	81
14	92	88	82	65	53	47.9j	40	35	38.6j	58	65.2j	74	81	81
15	91	87	81	64	53	47.8j	41	35	38.8j	58	65.6j	74	81	81
16	91	87	81	64	52	47.6j	41	36	39	58	65.9j	72	80	81
17	91	87	80	63	52	47.5j	41	36	46	58	66.3j	71	81	81
18	91	88	80	63	52	47.5j	40	35	47	58	66.7j	75	81	81
19	91	87	80	63	52	47	41	35	48	58	67j	75	81	81
20	91	87	79	62	51	43	41	36	49	59	67.4j	74	81	81
21	90	88	79	62	51	43	40	35	48	59	67.8j	74	81	81
22	91	87	79	62	51	43	40	34	49	58	68.1j	75	81	81
23	90	86	78	62	51	43	40	35	50	58	68.5j	75	81	81
24	90	86	78	62	51	43	40	35	50	59	68.9j	76	81	81
25	90	86	77	62	50	43	41	36	50	60	69.3j	75	81	81
26	90	86	77	61	51	42	41	36	50	60	69.6j	75	81	81
27	90	86	77	60	50	42	41	37	50	61	70j	75	82	81
28	90	86	76	60	49	41	40	36	52	64	70.4j	76	82	81
29	89	86	76	60	49	-	41	36.4j	51	62	70.7j	76	81	81
30	89	86	75	59	49	-	40	36.5j	51	62	71.1j	78	81	81
31	-	85	-	59	49	-	39	-	52	-	71.5j	77	-	-
AVG	91	87	81	66	53	45	41	36	49	57	63	75	80	81
														65

j= estimate during equipment failure

average for wateryear 2000-2001 = 61 cfs

## Appendix C

### Rocky Ford Creek Synoptic Flow Study

On September 25<sup>th</sup>, 2001, the Stream Hydrology Unit (SHU) measured flow at five sites on Rocky Ford Creek. The SHU gauging station located at the mouth of Rocky Ford Creek was used as a reference point during the study period. An established rating curve for this site was also used to determine the flow at this site.

Rocky Ford Creek is historically an algae and aquatic plant weed choked system. These are not ideal conditions for flow measurement. In an effort to get a better representation of the overall discharge at each site, 6/10<sup>th</sup> ft measurements were used. It was felt that by measuring at 6/10ths depth, the weed effect was minimized as best as could be. Regardless, the % error introduced by the presence of instream biota can add up to a 20% error to the assumed error of the cross-section.

**RF2A**                    47°19'286N, 119°26'339W **45.3 cfs**

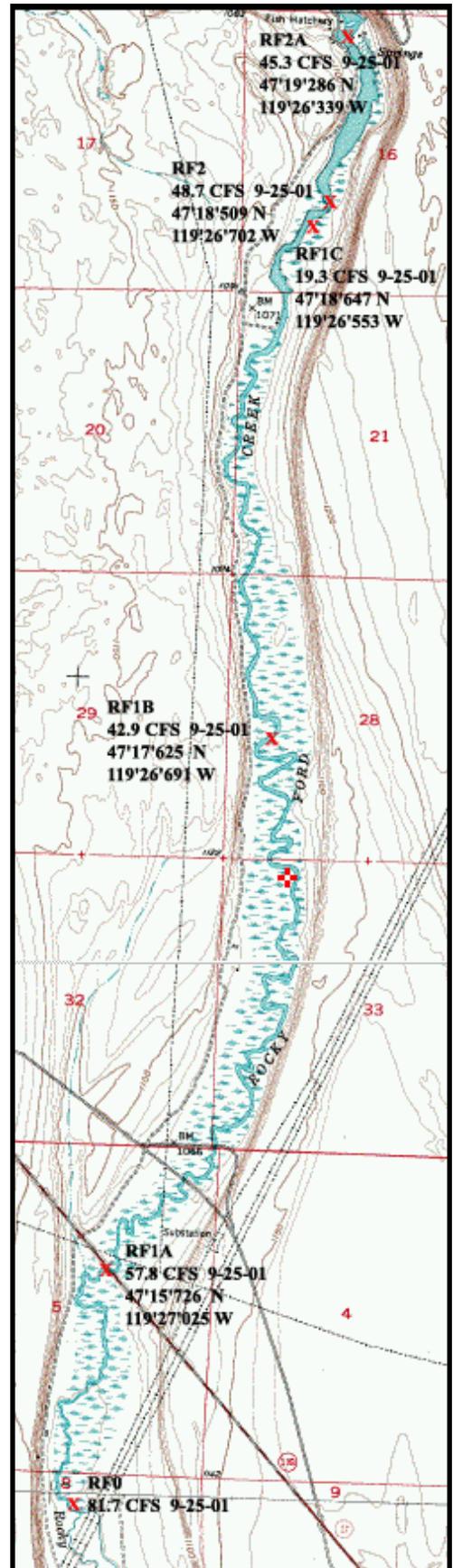
The uppermost site located 20ft downstream from the property line of the upper hatchery. Cross section was rated as fair, which assumes an error of up to 8%.

**RF2**                    47°18'509 N, 119°26'702 W **48.7 cfs**

Located at the old USGS gauge, measurement was made along the downstream side of the aluminum footbridge. Cross section was rated as poor which assumes an error of over 8%.

**RF1C**                    47°18'647 N, 119°26'553 W **19.3 cfs**

Located at the three by-pass weirs at the lower hatchery. This was the best of the cross sections. Rated as good, it assumes an error of up to 5%. From our measurements, it is estimated that the lower hatchery was diverting 29.7 cfs.



**RF1B**

47°17'625 N, 119°26'691 W **42.9 cfs**

Located just upstream from the private wood bridge on property owned by Rod Swanson. This cross section was rated as poor which assumes an error of over 8%. A soft substrate and a large plant/algae presence adds to the assumed error at this site.

**RF1A**

47°15'726 N, 119°27'025 W **57.8 cfs**

Located at the Highway 17 bridge, this cross section was rated fair. This assumes an error of up to 8%.

**RF0**

**81.7 cfs**

This cross section is considered fair which assumes an error of up to 8%. The discharge from this site is estimated from the SHU rating curve. A gage height was recorded both before and after the study period. The SHU gage recorded a change of .001 psi over a seven-hour period.

## Appendix D

Crab Creek (USGS station 12467000) - October 2000 through October 2001

Mean Daily Flow (cfs)

Crab Creek (USGS station 12467000) - October 2000 through October 2001

Mean Daily Flow (cfs)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
1	44	29	20	15	11	9	7.6	45	25	32	35	40	39
2	42	29	19	15	11	9.5	7.2	41	29	31	34	38	41
3	44	29	19	15	10	9	7	41	32	32	35	39	40
4	46	28	19	14	10	8.9	6.9	40	32	32	35	37	38
5	47	27	19	15	12	9.4	6.8	40	32	31	37	36	40
6	49	27	19	14	11	9.7	6.7	39	31	32	37	37	38
7	51	26	18	13	10	9.7	6.5	40	25	35	38	36	38
8	49	33	18	13	9.8	11	6.3	43	22	34	41	34	39
9	49	34	18	13	9.6	11	6.4	43	21	33	42	38	36
10	51	28	15	13	9.8	9.7	6	42	25	32	43	39	37
11	49	25	13	12	10	9.1	8.5	41	29	32	40	39	38
12	50	24	14	12	10	9.4	7.9	43	31	32	37	38	38
13	47	24	14	13	9.8	9.4	6.8	46	29	32	39	37	39
14	48	24	14	14	9.7	8.8	11	50	24	32	41	36	38
15	45	22	14	13	9.9	8.8	28	54	24	34	41	36	38
16	44	21	14	12	9.7	9.6	37	49	24	33	38	37	39
17	45	21	14	12	9.3	8.9	35	48	26	34	34	37	37
18	44	21	14	12	9.7	9	32	47	29	33	34	36	36
19	44	20	14	12	10	9.3	34	46	28	34	34	37	36
20	46	20	13	12	10	8.3	38	46	28	36	32	38	36
21	46	19	13	12	10	8	38	49	28	34	31	37	36
22	44	19	14	12	12	7.6	38	49	24	35	35	36	37
23	44	19	14	15	12	7.4	36	45	23	35	39	34	38
24	48	19	15	12	11	7.3	37	27	26	34	39	35	36
25	42	19	15	12	10	9.3	38	29	28	33	39	36	38
26	35	19	15	12	9.5	9.6	39	24	28	34	37	37	38
27	33	18	15	11	9.1	8.3	43	22	33	33	36	37	37
28	33	19	15	11	9	10	44	21	35	33	38	37	37
29	35	20	15	11		8.6	41	21	34	35	40	38	36
30	31	20	15	10		7.8	43	26	32	35	42	39	44
31	30		17	10		7.5		27		36	40		44
Avg	44	23	16	13	10	9	23	39	28	33	38	37	38

Average  
27

Average for wateryear 2000-2001 = 26 cfs

**Appendix E**  
**South Outlet - October 2000 through October 2001**  
**Estimated Daily Outflow (cfs)**

South Outlet - October 2000 through October 2001 Estimated Daily Outflow (cfs)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
1	222	301	365	281	373	46	1658	522	1292	246	18	1150	382
2	221	301	354	280	696	53	1832	529	1299	176	18	1541	382
3	196	301	345	279	667	50	1578	538	1311	176	18	1543	382
4	115	300	334	281	568	47	1116	461	1146	176	18	1545	300
5	41	299	331	279	326	228	2141	317	893	176	18	1422	261
6	118	2526	331	280	312	379	1636	218	663	168	18	1395	452
7	230	2461	323	280	296	372	1340	49	390	98	19	1134	735
8	230	1693	314	215	286	374	1114	12	207	93	68	1314	828
9	231	1560	306	104	276	378	982	13	163	73	74	1314	998
10	231	1422	300	102	267	387	982	13	95	88	74	1315	995
11	230	1275	285		260	392	951	14	18	104	85	1315	895
12	230	1159	251	102	252	406	970	108	18	116	207	1201	693
13	235	1074	245	102	245	409	1223	363	18	134	403	753	629
14	238	941	196	105	237	399	1462	421	18	142	802	680	631
15	241	830	108	105	234	385	1622	402	35	142	1072	807	632
16	238	765	142	104	235	369	1702	219	39	141	1281	807	632
17	238	710	145	105	232	355	1736	91	52	141	1460	806	631
18	239	661	130	106	230	344	1360	56	57	141	1650	837	628
19	238	619	112	107	230	339	1047	15	57	142	1703	1329	542
20	239	580	113	108	162	333	908	27	58	142	1700	1327	248
21	238	545	112	108	45	326	839	42	58	141	1623	1326	131
22	239	517	212	109	44	323	835	398	303	142	1483	1325	132
23	239	493	281	109	50	346	844	681	682	142	1481	1208	132
24	871	472	281	110	48	400	624	725	814	142	1038	737	132
25	1342	450	281	108	45	486	486	1147	719	142	383	621	132
26	1342	434	282	108	44	376	352	1232	506	142	502	672	132
27	1341	416	282	107	45	307	289	1244	415	142	637	885	132
28	804	405	281	105	45	352	285	974	272	141	682	1012	149
29	301	394	280	104		644	443	1027	230	140	1098	892	268
30	302	378	281	103		900	530	1287	279	60	1210	455	1082
31	301		281	102		1324		1289		18	948		1225
Avg	372	809	254	150	241	382	1096	466	404	134	703	1089	501
												Average	508

Average for wateryear 2000 - 2001 = 508 cfs

**Appendix F****North Culvert - October 2000 through October 2001****Estimated Daily Outflow (cfs)**

North Culvert October 2000 - October 2001 Estimated Daily Outflow (cfs)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
1	36	37	23	22	22	10	27	24	35	37	37	36	37
2	36	37	23	21	21	11	27	24	35	37	37	36	37
3	36	37	23	21	20	11	28	24	36	37	37	36	37
4	36	37	22	21	19	10	28	24	36	37	37	37	37
5	36	37	22	21	18	10	28	24	36	37	37	38	36
6	36	36	22	21	17	8	28	25	36	37	37	41	37
7	35	35	22	21	17	8	27	26	36	37	37	38	37
8	35	34	22	21	17	8	26	26	37	37	37	37	37
9	35	33	22	21	16	8	26	27	37	37	37	37	37
10	35	32	22	21	15	8	26	28	37	37	37	37	37
11	35	32	22	21	15	8	25	29	38	37	37	37	37
12	35	31	21	21	15	8	25	30	37	37	37	37	36
13	36	30	21	22	13	8	25	31	37	37	37	36	37
14	37	29	21	23	12	11	25	31	37	37	37	37	37
15	37	28	21	23	12	12	24	31	37	37	37	37	37
16	37	28	21	24	11	11	24	30	37	37	37	36	37
17	37	27	21	24	11	11	23	31	37	37	37	36	37
18	37	27	21	24	10	10	23	31	37	37	37	36	37
19	37	26	21	24	9	9	23	31	37	37	37	36	36
20	37	26	21	23	9	11	22	32	37	37	37	36	36
21	37	25	21	23	9	11	22	32	37	37	37	36	36
22	37	25	21	23	9	11	22	32	37	37	37	36	37
23	37	25	21	23	10	11	22	32	37	37	37	36	37
24	37	24	21	23	10	13	22	33	37	37	37	36	37
25	37	24	21	23	9	15	23	33	37	37	37	37	37
26	37	24	22	23	9	16	23	33	37	37	37	37	37
27	37	24	22	23	10	19	24	34	37	37	37	37	37
28	37	23	21	22	9	21	23	33	37	37	37	37	37
29	37	23	21	22		24	24	35	37	37	37	37	37
30	37	23	21	22		25	24	35	37	37	36	37	37
31	37		21	22		26		35		37	36		37
Avg	36	29	21	22	13	12	25	30	37	37	37	37	37
												Average	29

Average for wateryear 2000-2001 = 28 cfs



## **Appendix B**

### **Field and Laboratory Data**

Table B-1 - page 1. Field and Laboratory Data

station	date	time	depth (m)	Chlorophyll (SM10200H3M)	Total Suspended Solids (mg/L) (EPA160.2)	Total Persulfate Nitrogen (mg/L) (SM4500NB)	Total Organic Carbon (mg/L) (EPA415.1)	Total Non-Volatile Suspended Solids (mg/L) (EPA160.4)	Total Dissolved Solids (mg/L) (EPA160.1)	Total Alkalinity (mg/L) (SM2320)	Total Alkalinity (mg/L) (EPA310.2)	Sulfate (mg/L) (EPA300.0)	Temperature, water (deg C) (TEMP THERM)	Silicon (ug/L) (EPA200.7)	Phosphorus (mg/L) (SM4500Pi)
CBH-A	4/9/01		0			2.25									0.207
CBH-A	8/6/01		0			1.5									0.16
CBH-A	7/2/01		0			1.69 J									0.093 J
CBH-A	6/11/01		0			1.5									0.153
CBH-A	5/7/01		0			1.61									0.129
CBH-A	9/20/01		0			1.82 J									
CBH-D	4/24/01	14:50	0			3.02									0.103
CBH-D	8/28/01	11:45	0			2.38				245					0.075
CBH-D	7/31/01	11:50	0			3.18				245					0.074
CBH-D	6/26/01	14:30	0			3.34				253					0.098
CBH-D	5/29/01	12:45	0			3.06									0.062
CBH-D	9/25/01	14:55	0		1	2.36 J		1 U	330	252				14.86	
CBH-E	4/9/01		0			3.74									0.107
CBH-E	8/6/01		0			2.63									0.086
CBH-E	7/2/01		0			2.85 J									0.071 J
CBH-E	6/11/01		0			2.57									0.102
CBH-E	5/7/01		0			3.79									0.089
CBH-E	9/20/01		0			2.44 J									
CBH-I	4/9/01		0			4.01									0.089
CBH-I	4/24/01	14:40	0			2.92								16.9	0.086
CBH-I	8/6/01		0			2.59									0.073
CBH-I	8/28/01	11:30	0			2.36				246				15.02	0.067
CBH-I	7/2/01		0			3.16 J									0.064 J
CBH-I	7/31/01	11:30	0			3.05				247				15.5	0.067
CBH-I	6/11/01		0			3.37									0.086
CBH-I	6/26/01	14:05	0			3.33				264				15.84	0.079
CBH-I	5/7/01		0			2.93									0.073
CBH-I	5/29/01	12:10	0			3.34								15.8	0.059
CBH-I	9/20/01		0			3.43 J									
CBH-I	9/25/01	14:45	0		2	2.51 J		1	335	251				14.78	
CC0	4/23/01	16:30	0		4	0.102			86 J		66.1			8.75	0.013
CC0	4/24/01	16:10	0	4.75	3.5	0.073	1.5		76 J		65.9			10.12	0.013
CC0	8/27/01	16:10	0		2	0.487		2	134	104					0.017
CC0	8/27/01	18:00	0											18.96	
CC0	8/28/01	10:35	0	2.1 J	2	0.4985	2.05	1.5	141	107				18.89	0.0175
CC0	7/30/01	18:00	0		2	1		2	223	168					0.027
CC0	7/31/01	18:00	0											22.27	
CC0	7/31/01	10:25	0	1.83 J	1.5 U	1.1575	2.25 J	1 U	244.5	178.5				17.28	0.024
CC0	6/25/01	14:45	0		6	0.176			107	79.1					0.018
CC0	6/26/01	16:50	0	2.7	3	0.243	2		126	93.3				18.76	0.014
CC0	3/26/01	11:50	0	14	10	0.152	2		90		66.9			5.73	
CC0	5/29/01	10:45	0	2.55 J	4	0.1215	1.45 J		94	69.5				13.98	0.016
CC0	9/25/01	15:30	0		2	0.493 J		1 U	140	104				16.88	5920
CC0	9/25/01	7:45	0	2 J	2	0.434 J	1.5	1	127	95.3				16.64	
CC1	4/24/01	14:05	0	8.6	6	0.203	3.4		218 J		189			17.3	0.037
CC1	8/28/01	13:10	0	6.7	7	0.892	3		296	241				21.15	0.037
CC1	7/31/01	13:10	0	5.22	9	0.663	3.1 J		259	206				21.01	0.034
CC1	6/26/01	13:40	0	12.3	12	0.785	3.1		263	207				18.5	0.039
CC1	3/26/01	14:20	0	30.55	11	0.5845	6.15		378 J		303.5			13.63	
CC1	5/29/01	13:45	0	9.8	9	1.07	2.9 J		274	218				17.96	0.036
CC1	9/25/01	8:10	0	5.5 J	5	0.887 J	2.7	4	316	251				13.8	
CC2	4/24/01	13:30	0		21	0.359									0.049
CC2	8/28/01	13:30	0		5	0.893								21.38	0.036

Table B-1 - page 2. Field and Laboratory Data

	Phosphorus (mg/L) (SM4500PH)	Phosphorus (mg/L) (EPA365.1)	pH (pH) (WASPH)	Ortho-Phosphate (mg/L) (SM4500PG)	Ortho-Phosphate (mg/L) (EPA365.3M)	Nitrite-Phosphate (mg/L) (SM4500NO3I)	Dissolved Oxygen (mg/L) (DOFM)	Dissolved Organic Carbon (mg/L) (EPA415.1)	Turbidity (NTU) (SM2130)	Conductivity (umhos/cm) (EPA120.1)	Conductivity (umhos/cm) (CONDIMETER)	Chloride (mg/L) (EPA300.0)	Flow (cfs) (MIDSECTION)	Ammonia (mg/L) (SM4500NH3H)	Ammonia (mg/L) (EPA350.1)
						1.98									0.071
						1.25								0.179	
						1.26 J								0.16 J	
						1.07								0.224	
						1.33								0.096	
0.116 J						1.51								0.226	
	8.23	0.064	0.07	2.74					557	508	4.74			0.092	
	7.98	0.058		2.03	9.19			503	472	4.22	18.5	0.064			
	8.02	0.052		2.29	10.04			498	496	4.1	20.14	0.048			
	8.05	0.052		2.73	10.65			515	485.9	4.4	14.47	0.054			
		0.046		2.7				521		4.1	14.04	0.04			
0.063 J	7.86	0.071		2.13	8.14			511	506	3.72		0.073			
				2.82										0.089	
				2.33										0.035	
				2.63 J										0.047 J	
				2.63										0.055	
				2.86										0.045	
0.056 J				2.28										0.04	
				2.85										0.01 U	
	8.05	0.055	0.055	2.68				564	516	4.34				0.01 U	
				2.28										0.01 U	
	7.87	0.056		1.95	10.32			505	482	4.17		0.01 U			
				2.78 J										0.01 UJ	
	7.92	0.052		2.39	10.48			503	505	4.24		0.01 UJ			
				2.76										0.01 U	
	7.83	0.049		2.96	9.5			538	504.6	4.71		0.01 U			
				2.8										0.01 U	
	7.96	0.044		2.77	11.27			541	521	4.25		0.01 U			
0.043 J				2.22										0.01 U	
0.043 J	7.67	0.0555		2.23	8.81			509	505	3.53		0.01 U			
	8.71			0.03	13			150	130.8	1.02				0.01 U	
	8.79		0.005 U	0.027	12.61	1.5	1.4	150	131.3	0.971				0.01 U	
				0.395				235		1.93		0.01 U			
	8.33				10.6				385						
	8.14	0.0115		0.4085	9.47	1.85	1.25	241.5	226	2.015		0.01 U			
				0.859				352		3.22		0.01 U			
	8.94				13.5				353						
	8.31	0.0145		0.992	10.9	2 J	0.8	385.5	376	3.605		0.01 U			
				0.006	0.096			178		1.18		0.01 U			
	8.5	0.007		0.15	11.17	1.9	1.4	206	181.5	1.37		0.011			
0.022	8.13		0.005 U	0.051		1.9	3.8	155	130.9	1.2				0.01 U	
	8.4	0.005 U		0.06	10.65	1.4 J	1.55	157	146.4	0.8945		0.01 U			
0.014 J	8.15	0.011		0.376	9.22			234	225	1.87		0.01 U			
0.013 J	7.96	0.01		0.321	8.68	1.6	0.8	216	217	1.68		0.01 U			
	9.11		0.008	0.025		3.3	3.3	378	339	4.08				0.012	
	8.32	0.016		0.67	12.13	2.5	3.8	472	447	3.11		0.014			
	8.43	0.014		0.438	12.17	2.8 J	4.1	412	408	2.56		0.01 U			
	8.21	0.012		0.626	11.74	2.7	5.6	414	377.7	3.02		0.015			
0.084	8.71		0.02	0.2635		5.4	5.4	595	533	7.55				0.012	
	8.96	0.012		0.895	14.35	2.9 J	4.6	431	413	3.8		0.015			
0.021 J	8.08	0.015		0.695	7.38	2.6	2.8	497	490	3.09		0.01 U			
	8.91		0.007	0.184				347	312	3.78	6.21		0.022		
	8.51	0.017		0.722	13.39			392	371	2.29	23.33	0.01 U			

Table B-1 - page 3. Field and Laboratory Data

station	date	time	depth (m)	Chlorophyll (SM10200H3M)	Total Suspended Solids (mg/L) (EPA160.2)	Total Persulfate Nitrogen (mg/L) (SM4500NB)	Total Organic Carbon (mg/L) (EPA415.1)	Total Non-Volatile Suspended Solids (mg/L) (EPA160.4)	Total Dissolved Solids (mg/L) (EPA160.1)	Total Alkalinity (mg/L) (SM2320)	Total Alkalinity (mg/L) (EPA310.2)	Sulfate (mg/L) (EPA300.0)	Temperature, water (deg C) (TEMP THERM)	Silicon (ug/L) (EPA200.7)	Phosphorus (mg/L) (SM4500P)
CC2	7/31/01	13:35	0		4	0.827							21.25		0.03
CC2	6/26/01	13:00	0		5	0.93							17.1		0.031
CC2	3/26/01	16:32	0		30	0.838									
CC2	5/29/01	14:10	0		9	1.17							18.54		0.034
CC2	9/25/01	14:00	0		8	1 J							15.13		
CC3	4/24/01	12:55	0		12	0.292							16.7		0.043
CC4	4/24/01	11:40	0		17	2.31							16.47		0.08
CC4	8/28/01	14:20	0	7.8	9	6.16	3		390	249			25.14		0.04
CC4	7/31/01	14:20	0	5.81	12	5.66	3 J		370	222			25.46		0.047
CC4	6/26/01	11:10	0	29.5	11.5	3.5	3.6		391	253.5			17.95		0.061
CC4	3/26/01	15:10	0	107	42	2.19	5.5		301		201		14.98		
CC4	5/29/01	14:55	0		14	1.28			381	264			21.95		0.057
CC4	9/25/01	9:15	0	2.9 J	4	5.46 J	2.4	3	274 J	283			15.55		
CC5	4/24/01	11:00	0		5	0.064							11.37		0.015
CC6	4/24/01	9:55	0	29.5 J	26	0.313	6.9		272 J		172		12.1		0.076
CC6	5/29/01	15:35	0										18.29		
CC6	5/29/01	15:45	0		21	0.34				184					0.061
ML1	4/25/01	13:41	0.5										15.05		
ML1	4/25/01	13:43	1										13.8		
ML1	4/25/01	13:45	0.4	10.2 J		0.177									0.017
ML1	4/25/01	13:45	2										13.47		
ML1	4/25/01	13:45	3										13.1		
ML1	4/25/01	13:45	4										12.51		
ML1	4/25/01	13:46	5										12.13		
ML1	4/25/01	13:49	6										11.39		
ML1	4/25/01	13:55	0.5	7.2 J		0.15	2.3		157		116				0.015
ML1	4/25/01	14:05	3	11.9 J		0.234	2.7		174		128				0.033
ML1	4/25/01	14:15	5	36.6 J		0.431	3.4		200		149				0.031
ML1	8/1/01	14:30	0.4	33.9		0.427									0.043
ML1	8/1/01	14:44	0.5										23.63		
ML1	8/1/01	14:44	1										23.63		
ML1	8/1/01	14:45	2										23.62		
ML1	8/1/01	14:45	3										23.02		
ML1	8/1/01	14:46	4										22.46		
ML1	8/1/01	14:47	5										22.36		
ML1	8/1/01	14:48	6										21.96		
ML1	8/1/01	15:00	0.5	35.4		0.367	3.5 J		167	130					0.04
ML1	8/1/01	15:05	3	36	13	0.3155	3.6 J	7	172	130					0.0235
ML1	8/1/01	15:20	5	20.1		0.493	3.1 J		179	133					0.055
ML1	8/29/01	13:27	0.4	16.8		0.333									0.017
ML1	8/29/01	13:36	0.5										24.64		
ML1	8/29/01	13:43	5										20.92		
ML1	8/29/01	13:50	0.5	23.3		0.344	3.6		151	116					0.02
ML1	8/29/01	14:05	0.5	25.8	7	0.333	2.9	3	156	116					0.017
ML1	8/29/01	14:15	3	59.8	18	0.3345	4.3	10	159	119					0.0205
ML1	8/29/01	14:27	5	29.5		0.808	3.4		193	140					0.032
ML1	8/29/01		1										24		
ML1	8/29/01		2										22.86		
ML1	8/29/01		3										22.27		
ML1	8/29/01		4										21.3		
ML1	8/29/01		5										20.87		
ML1	8/29/01		6										23.44		
ML1	7/2/01		1												

Table B-1 - page 4. Field and Laboratory Data

Phosphorus (mg/L) (SM4500PH)	Phosphorus (mg/L) (EPA365.1)	pH (pH) (WASPH)	Ortho-Phosphate (mg/L) (SM4500PG)	Ortho-Phosphate (mg/L) (EPA365.3M)	Nitrite-Nitrate (mg/L) (SM4500NO3I)	Dissolved Oxygen (mg/L) (DOFM)	Dissolved Organic Carbon (mg/L) (EPA415.1)	Turbidity (NTU) (SM2130)	Conductivity (umhos/cm) (EPA120.1)	Conductivity (umhos/cm) (CONDIMETER)	Chloride (mg/L) (EPA300.0)	Flow (cfs) (MIDSECTION)	Ammonia (mg/L) (SM4500NH3H)	Ammonia (mg/L) (EPA350.1)
	8.57	0.013		0.658	13.01				375	370	2.43	23.25	0.01 U	
	8.38	0.012		0.782	12.22				384	354.9	3.02	21.36	0.01 U	
0.108		0.011	0.441					581		8.12			0.032	
	8.76	0.013		1.01	13.75			409	395	3.59	13.5	0.013		
0.025 J	8.35	0.017		0.824	11.35			408	401	2.65	19.58	0.01 U		
	8.65		0.009	0.022					483	9.54	0.23		0.034	
	8.9		0.01	1.98					446	13.8	0.58		0.048	
	8.45	0.014		4.58		2.5	5.5	597	579	14	1.16	0.024		
	8.5	0.012		4.5	13.71	2.8 J		562	556	14.3	0.83	0.038		
	8.17	0.0125		2.955	10.09	3.2	7.6	595	557.8	14.35	1.15	0.0445		
0.096	8.93		0.008	1.88		3	19	479	436	13	0.35		0.023	
	8.68	0.015		0.945	12.6			583	569	14.2	0.5	0.042		
0.014 J	8.15	0.014		4.91	12.65	2.4	3.3	653	650	12.2	1.23	0.017		
	8.25		0.005 U	0.01 U					117.9	0.83	2.63		0.01 U	
	8.56		0.006	0.01 U		6.8	21	448	402	14.8	14.51		0.035	
	8.55				7.4				459					
		0.009		0.013						14.3		0.042		
	9.3				12.15					233				
	9.32				12.54					233				
		0.005 U	0.042										0.01 U	
	9.34				12.66					235				
	9.36				12.94					268				
	9.35				13.05					290				
	9.19				10.79					305				
	9				7.36					310				
		0.005 U	0.014		2.1	2.2	260		4.47				0.01 U	
		0.005 U	0.055		2.3	4.3	288		5.33				0.017	
		0.005 U	0.211		3.1				7.12				0.013	
	0.006		0.01 U										0.01 UJ	
	8.99				11.03				284					
	8.99				11.02				284					
	8.98				10.97				285					
	8.94				9.97				282					
	8.83				8.04				287					
	8.71				7.12				289					
	8.16				1.38				310					
	0.005		0.01 U		2.9 J	9.3	286		4.47				0.01 UJ	
	0.006		0.01 U		2.9 J	9.7	286		4.47				0.01 UJ	
	0.014		0.019		2.7 J				4.41				0.028	
	0.005 U		0.01 U										0.01 U	
	9.09				12.58				246					
		0.005 U	0.01 U		3	4.9	257		4.36				0.01 U	
		0.005 U	0.01 U		3.6 J	5.1	260		4.36				0.01 U	
		0.005 U	0.01 U		3	11	267		4.73				0.01 U	
		0.006	0.174		2.9				5.34				0.255	
	9.12				13.19				244					
	9.16				13.56				248					
	9				9.22				255					
	8.72				5.56				279					
	8.36				2.07				295					
	8.1				0.25				301					
	8.95				11.96				261					

Table B-1 - page 5. Field and Laboratory Data

station	date	time	depth (m)	Chlorophyll (ug/L) (SM10200H3M)	Total Suspended Solids (mg/L) (EPA160.2)	Total Persulfate Nitrogen (mg/L) (SM4500NB)	Total Organic Carbon (mg/L) (EPA415.1)	Total Non-Volatile Suspended Solids (mg/L) (EPA160.4)	Total Dissolved Solids (mg/L) (EPA160.1)	Total Alkalinity (mg/L) (SM2320)	Total Alkalinity (mg/L) (EPA310.2)	Sulfate (mg/L) (EPA300.0)	Temperature, water (deg C) (TEMP THERM)	Silicon (ug/L) (EPA200.7)	Phosphorus (mg/L) (SM4500PI)
ML1	7/2/01		2										22.52		
ML1	7/2/01		3										22.23		
ML1	7/2/01		4										21.98		
ML1	7/2/01		5										19.49		
ML1	7/2/01		6										18.94		
ML1	7/2/01	12:25	0.4	9.1									23.6		
ML1	7/2/01	12:30	0.5												
ML1	7/2/01	12:40	0.5	7.6		0.171	3.8		157	121				0.016	
ML1	7/2/01	12:45	3	5.9		0.162	3.7		152	121				0.015	
ML1	7/2/01	12:55	5	17		0.593	3.6		193	148				0.038	
ML1	3/28/01	13:00	1										8.73		
ML1	3/28/01	13:02	2										8.62		
ML1	3/28/01	13:03	3										8.6		
ML1	3/28/01	13:03	4.5										8.62		
ML1	3/28/01	13:30	0.5	58.6			3.4		379	175					
ML1	3/28/01	13:45	3	47.8			3.2		248	180					
ML1	3/28/01	12:52	0.5										9.05		
ML1	5/30/01	9:25	0.4	18.4 J		0.336									0.024
ML1	5/30/01	9:39	0												
ML1	5/30/01	9:42	0.5										17.08		
ML1	5/30/01	9:43	1										16.89		
ML1	5/30/01	9:44	2										16.86		
ML1	5/30/01	9:44	3										16.59		
ML1	5/30/01	9:45	4										16.32		
ML1	5/30/01	9:46	5										16.02		
ML1	5/30/01	9:47	6										16.4		
ML1	5/30/01	9:55	0.5	15.1		0.329	2.9 J		178	133					0.021
ML1	5/30/01	10:10	3	16		0.316	3.2 J		177	133					0.023
ML1	5/30/01	10:20	5	14.7		0.328	3.1 J		172	133					0.03
ML1	9/26/01	13:11	0.5										18.85		
ML1	9/26/01	13:11	1										18.85		
ML1	9/26/01	13:12	2										18.82		
ML1	9/26/01	13:13	3										18.79		
ML1	9/26/01	13:13	4										18.77		
ML1	9/26/01	13:14	5										18.75		
ML1	9/26/01	13:14	6										18.73		
ML1	9/26/01	13:20	0.5	12.7		0.682 J	3.4 J		162	118					
ML1	9/26/01	13:25	3	13.05	6	0.50425 J	3.2	3	162	117			5170		
ML1	9/26/01	13:50	5	14.2		0.455 J	3.2		165	117					
ML2	4/25/01	11:52	0.5										12.38		
ML2	4/25/01	11:54	1										11.62		
ML2	4/25/01	11:55	2										11.39		
ML2	4/25/01	11:56	3										11.16		
ML2	4/25/01	11:57	4										10.85		
ML2	4/25/01	11:58	5										10.68		
ML2	4/25/01	11:59	6										10.4		
ML2	4/25/01	12:00	7										9.73		
ML2	4/25/01	12:02	7.8										9.35		
ML2	4/25/01	12:05	0.5	6.9 J		0.105	1.9		124		96.3				0.012
ML2	4/25/01	12:15	3	12.5 J		0.127	2.3		122		100				0.016
ML2	4/25/01	12:25	6	21.8 J		0.16	1.8		146		111				0.023
ML2	4/25/01	12:50	0.4	11.2 J		0.131									0.014
ML2	8/1/01	15:45	0.4	14.5		0.462									0.048

Table B-1 - page 6. Field and Laboratory Data

Phosphorus (mg/L) (SM4500PH)	Phosphorus (mg/L) (EPA365.1)	pH (pH) (WASPH)	Ortho-Phosphate (mg/L) (SM4500PG)	Ortho-Phosphate (mg/L) (EPA365.3M)	Nitrite-Nitrate (mg/L) (SM4500NO3I)	Dissolved Oxygen (mg/L) (DOFM)	Dissolved Organic Carbon (mg/L) (EPA415.1)	Turbidity (NTU) (SM2130)	Conductivity (umhos/cm) (EPA120.1)	Conductivity (umhos/cm) (CONDIMETER)	Chloride (mg/L) (EPA300.0)	Flow (cfs) (MIDSECTION)	Ammonia (mg/L) (SM4500NH3H)	Ammonia (mg/L) (EPA350.1)
9	9	9			12.17									
9.01					12.41									
9					12.12									
8.18					1.92									
7.9					1.12									
8.95					11.73									
	0.006		0.01 U		3.5 J	4.4	269		4.31		0.01 U			
	0.005 U		0.01 U		3.2 J	4.7	266		4.28		0.01 U			
	0.013		0.063		3	10.5			4.74		0.291			
	8.8								347					
	8.79								349					
	8.77								349					
	8.75								353					
0.051		0.006	0.379		2.3	9.9	390		7.88		0.013			
0.054		0.006	0.369		2.2	9.9	396		7.97		0.015			
	8.85								343					
	0.005 U		0.114								0.024			
					10.8									
9.04					10.79				300					
9.04					10.66				301					
9.03					10.67				301					
9.02					10.57				301					
9					10.56				304					
8.99					10.66				306					
8.96					10.16				301					
	0.005 U		0.117		2.7 J	4.9	299		5.18		0.026			
	0.005 U		0.113		2.6 J	5.2	299		5.14		0.026			
	0.005 U		0.111		2.6 J				5.15		0.03			
	8.78				7.72				263					
	8.79				7.8				262					
	8.82				7.99				262					
	8.84				8.07				262					
	8.85				8.15				262					
	8.85				8.15				262					
	8.85				8.04				262					
0.023 J	0.0036		0.059		2.8	4.1	267		4.47		0.093			
0.016 UJ	0.0038		0.0585		2.75	4.1	268		4.395		0.0875			
0.023 J	0.0036		0.056		2.8				4.34		0.077			
	9.18				12.15				197					
	9.16				12.32				180					
	9.22				12.64				192					
	9.32				12.84				212					
	9.29				12.84				221					
	9.22				11.7				219					
	9.08				10.53				219					
	8.84				8.6				219					
	8.48				5.75				224					
	0.005 U	0.01 U			1.8	2	217		3				0.01 U	
	0.005 U	0.01 U			1.9	3.2	225		3.31				0.01 U	
	0.005 U	0.014			2.7	5.1			3.95				0.01 U	
	0.005 U	0.01 U											0.01 U	
	0.024		0.01 U									0.133		

Table B-1 - page 7. Field and Laboratory Data

station	date	time	depth (m)	Chlorophyll (ug/L) (SM10200H3M)	Total Suspended Solids (mg/L) (EPA160.2)	Total Persulfate Nitrogen (mg/L) (SM4500NB)	Total Organic Carbon (mg/L) (EPA415.1)	Total Non-Volatile Suspended Solids (mg/L) (EPA160.4)	Total Dissolved Solids (mg/L) (EPA160.1)	Total Alkalinity (mg/L) (SM2320)	Total Alkalinity (mg/L) (EPA310.2)	Sulfate (mg/L) (EPA300.0)	Temperature, water (deg C) (TEMP THERM)	Silicon (ug/L) (EPA200.7)	Phosphorus (mg/L) (SM4500PI)
ML2	8/1/01	16:30	0.5	12.1	5	0.4415	3.4 J								0.037
ML2	8/1/01	16:45	3	11.2	5	0.4635	3.3 J								0.0395
ML2	8/1/01	17:10	6	9.94	5	0.4815	3.2 J	4	170	133					0.04
ML2	8/1/01	8:10	0.5												22.59
ML2	8/1/01	8:10	1												22.53
ML2	8/1/01	8:11	2												22.01
ML2	8/1/01	8:12	3												21.7
ML2	8/1/01	8:13	4												21.63
ML2	8/1/01	8:14	5												21.55
ML2	8/1/01	8:15	6												21.5
ML2	8/1/01	8:16	7												21.43
ML2	8/1/01		3	11.4	4	0.4895	3.3 J	2	173	132					0.0465
ML2	8/14/01	15:10	0.5												27.02
ML2	8/14/01		1												26.53
ML2	8/14/01		2												25.46
ML2	8/14/01		3												25.25
ML2	8/14/01		4												24
ML2	8/14/01		5												22.86
ML2	8/14/01		6												22.44
ML2	8/14/01		7												22.16
ML2	8/14/01		8												21.54
ML2	8/15/01	17:38	0.5												27.39
ML2	8/15/01	8:36	0.5												25.48
ML2	8/15/01		1												25.765
ML2	8/15/01		2												25.56
ML2	8/15/01		3												24.57
ML2	8/15/01		4												23.55
ML2	8/15/01		5												22.665
ML2	8/15/01		6												22.335
ML2	8/15/01		7												21.91
ML2	8/15/01		8												21.48
ML2	8/16/01	17:45	0.5												27.5
ML2	8/16/01		1												26.11
ML2	8/16/01		2												25.62
ML2	8/16/01		3												25.01
ML2	8/16/01		4												23.27
ML2	8/16/01		5												22.52
ML2	8/16/01		6												22.28
ML2	8/16/01		7												21.98
ML2	8/16/01		8												21.51
ML2	8/29/01	14:56	0.4	6.9		0.254									0.011
ML2	8/29/01	15:30	0.5	8.5	5	0.258	3	3	137	113					0.0125 U
ML2	8/29/01	15:42	3	20.6	12	0.256	4	7	150	111					0.013 U
ML2	8/29/01	15:53	6	47.8	11	0.301	4.1	6	154	118					0.0145
ML2	8/29/01	16:07	0.5												24.24
ML2	8/29/01		1												23.82
ML2	8/29/01		2												22.98
ML2	8/29/01		3												22.12
ML2	8/29/01		4												21.8
ML2	8/29/01		5												21.59
ML2	8/29/01		6												21.38
ML2	8/29/01		7												20.92
ML2	8/29/01		8												19.96

Table B-1 - page 8. Field and Laboratory Data

Phosphorus (mg/L) (SM4500PH)	Phosphorus (mg/L) (EPA365.1)	pH (pH) (WASPH)	Ortho-Phosphate (mg/L) (SM4500PG)	Ortho-Phosphate (mg/L) (EPA365.3M)	Nitrite-Nitrate (mg/L) (SM4500NO3I)	Dissolved Oxygen (mg/L) (DOFM)	Dissolved Organic Carbon (mg/L) (EPA415.1)	Turbidity (NTU) (SM2130)	Conductivity (umhos/cm) (EPA120.1)	Conductivity (umhos/cm) (CONDIMETER)	Chloride (mg/L) (EPA300.0)	Flow (cfs) (MIDSECTION)	Ammonia (mg/L) (SM4500NH3H)	Ammonia (mg/L) (EPA350.1)
		0.026		0.01 U		3 J	3.6	292			4		0.143	
		0.03		0.01 U		3.1 J	3.6	294			4		0.167	
		0.03		0.01 U		3.1 J	4.6	294			3.95		0.182	
8.51					6.83				291					
8.48					6.55				291					
8.37					5.37				292					
8.27					4.49				292					
8.22					4.65				294					
8.26					4.6				295					
8.25					4.89				291					
8.12					3.46				295					
		0.03		0.01 U		3 J	3.8	291			4.01		0.163	
9.11					14.2				239					
9.16					14.7				238					
9.11					14.73				244					
8.98					12.4				246					
8.75					10.4				256					
8.2					4.2				280					
7.96					2.2				284					
7.86					1.25				287					
7.66					0.2				307					
9.06					14.15				236					
9.06					12.95				239					
9.075					14.245				237.5					
9.09					14.53				237					
8.705					7.37				262.5					
8.385					5.03				273					
8.02					2.705				281.5					
7.865					1.4				285.5					
7.76					0.23				291.5					
7.63					0.22				306					
8.93					13.81				245					
9.02					14.69				242					
9.15					16.41				233					
9.05					14.54				234					
8.12					2.7				280					
7.82					1.3				286					
7.75					0.26				287					
7.69					0.2				294					
7.56					0.18				313					
		0.005 U		0.01 U								0.01 U		
		0.005 U		0.01 U		2.8	3.3	248			3.86		0.01 U	
		0.005 U		0.01 U		2.7	5.7	243			3.71		0.01 U	
		0.005 U		0.011		2.6	4.8	266			3.81		0.034	
9.07					13.9				236					
9.09					14.55				237					
9.12					14.48				232					
9.1					14.12				232					
9.08					13.55				239					
8.91					9.49				250					
8.52					5.97				250					
8.16					2.89				240					
7.82					0.22				227					

Table B-1 - page 9. Field and Laboratory Data

station	date	time	depth (m)	Chlorophyll (ug/L) (SM10200H3M)	Total Suspended Solids (mg/L) (EPA160.2)	Total Persulfate Nitrogen (mg/L) (SM4500NB)	Total Organic Carbon (mg/L) (EPA415.1)	Total Non-Volatile Suspended Solids (mg/L) (EPA160.4)	Total Dissolved Solids (mg/L) (EPA160.1)	Total Alkalinity (mg/L) (SM2320)	Total Alkalinity (mg/L) (EPA310.2)	Sulfate (mg/L) (EPA300.0)	Temperature, water (deg C) (TEMP THERM)	Silicon (ug/L) (EPA200.7)	Phosphorus (mg/L) (SM4500Pi)
ML2	7/2/01	14:40	0.4	3.8											
ML2	7/2/01	14:45	0.5										22.82		
ML2	7/2/01	15:00	0.5	6.7		0.144			147	116				0.011	
ML2	7/2/01	15:10	3	7.1		0.156	3.3		153	119				0.019	
ML2	7/2/01	15:20	6	5.5		0.407	3.4		174	132				0.039	
ML2	7/2/01		1										22.01		
ML2	7/2/01		2										21.27		
ML2	7/2/01		3										21.08		
ML2	7/2/01		4										20.8		
ML2	7/2/01		5										19.42		
ML2	7/2/01		6										19.11		
ML2	7/2/01		7										18.73		
ML2	7/2/01		8										18.17		
ML2	3/28/01	14:47	0.5										6.68		
ML2	3/28/01	14:47	0												
ML2	3/28/01	14:49	1.5										7.04		
ML2	3/28/01	14:50	3										8.08		
ML2	3/28/01	14:51	4.5										8.16		
ML2	3/28/01	14:52	6										8.16		
ML2	3/28/01	15:00	0.5	12.9		2.2			127	98.4					
ML2	3/28/01	15:10	3	28.6		3			195	143					
ML2	3/28/01	15:25	6	37.3		3.1			252	181					
ML2	5/30/01	10:50	0.4	4.1		0.358								0.032	
ML2	5/30/01	11:02	0.5										17.33		
ML2	5/30/01	11:03	1										17.3		
ML2	5/30/01	11:03	2										17.26		
ML2	5/30/01	11:04	3										17.22		
ML2	5/30/01	11:05	4										17.01		
ML2	5/30/01	11:05	5										16.89		
ML2	5/30/01	11:06	6										16.55		
ML2	5/30/01	11:07	7										16.34		
ML2	5/30/01	11:08	8										15.71		
ML2	5/30/01	11:15	0.5	3.8		0.25	2.3 J		145	112				0.033	
ML2	5/30/01	11:25	3	4.2		0.26	2.3 J		145	112				0.04	
ML2	5/30/01	11:40	6	3.5		0.29	2.3 J		153	115				0.043	
ML2	5/30/01		0												
ML2	9/26/01	11:30	0.5										18.85		
ML2	9/26/01	11:40	0.5	8.3	13	0.374 J	2.4	11	141	107			4480		
ML2	9/26/01	11:55	3	8.4	13	0.3615 J	2.6	11	142	109					
ML2	9/26/01		1										18.86		
ML2	9/26/01		2										18.85		
ML2	9/26/01		3										18.85		
ML2	9/26/01		4										18.85		
ML2	9/26/01		5										18.85		
ML2	9/26/01		6										18.85		
ML2	9/26/01		7										18.87		
ML2	9/26/01	12:05	6	8.6	15	0.465 J	2.4	13	138	108			4495		
ML3	4/25/01	10:02	0.5										13.38		
ML3	4/25/01	10:03	1										13.27		
ML3	4/25/01	10:03	2										12.69		
ML3	4/25/01	10:04	3										11.22		
ML3	4/25/01	10:04	4										10.99		
ML3	4/25/01	10:05	5										10.9		

Table B-1 - page 10. Field and Laboratory Data

Phosphorus (mg/L) (SM4500PH)	Phosphorus (mg/L) (EPA365.1)	pH (pH) (WASPH)	Ortho-Phosphate (mg/L) (SM4500PG)	Ortho-Phosphate (mg/L) (EPA365.3M)	Nitrite-Nitrate (mg/L) (SM4500NO3I)	Dissolved Oxygen (mg/L) (DOFM)	Dissolved Organic Carbon (mg/L) (EPA415.1)	Turbidity (NTU) (SM2130)	Conductivity (umhos/cm) (EPA120.1)	Conductivity (umhos/cm) (CONDIMETER)	Chloride (mg/L) (EPA300.0)	Flow (cfs) (MIDSECTION)	Ammonia (mg/L) (SM4500NH3H)	Ammonia (mg/L) (EPA350.1)
		8.95				11.25								
		0.005		0.01 U			1.5	261			3.63		0.01 U	
		0.005 U		0.01 U		3.1	1.8	259			3.53		0.01 U	
		0.027		0.021		2.9	2.4	293			4.21		0.191	
		8.97			11.67				249					
		8.98			12.11				248					
		9			12.41				249					
		9.01			12.67				254					
		8.53			6.43				266					
		8.11			2.48				285					
		7.93			1.59				279					
		7.84			0.8				269					
		8.69			15.21				196					
					15.25									
		8.71			15.32				232					
		8.67			14.59				336					
		8.68			14.16				357					
		8.66			13.57				363					
		0.023		0.005 U	0.118		1.9	2.8	223		3.01		0.01 U	
		0.034		0.005 U	0.239		2.1	5.5	320		5.61		0.01 U	
		0.046		0.005	0.346		2.3	5.6			7.9		0.023	
			0.017		0.031							0.079		
		8.58				8.3			239					
		8.57				8.28			239					
		8.58				8.15			239					
		8.56				8.15			239					
		8.53				7.75			241					
		8.48				7.22			243					
		8.36				6.83			246					
		8.32				6.5			244					
		8.07				3.37			249					
		0.018		0.029		2.2 J	1.4	252			3.47		0.071	
		0.019		0.029		2.2 J	1.4	253			3.53		0.073	
		0.029		0.029		2.2 J	1.6	259			3.62		0.1	
					8.19									
		8.72				8.09			232					
0.022 UJ		0.0063		0.032		2.3	9.7	238			3.25		0.083	
0.0225 UJ		0.0064		0.031		2.3	9.9	241			3.37		0.093	
		8.72				8.03			231					
		8.72				7.9			231					
		8.71				7.89			232					
		8.7				7.9			231					
		8.7				7.79			232					
		8.69				7.79			234					
		8.68				7.68			232					
0.021 UJ		0.0066		0.031		2.3	11				3.26		0.093	
		9.35				12.32			239					
		9.36				12.45			239					
		9.36				12.36			228					
		9.34				12.7			210					
		9.3				12.52			208					
		9.26				12.03			207					

Table B-1 - page 11. Field and Laboratory Data

station	date	time	depth (m)	Chlorophyll (ug/L) (SM10200H3M)	Total Suspended Solids (mg/L) (EPA160.2)	Total Persulfate Nitrogen (mg/L) (SM4500NB)	Total Organic Carbon (mg/L) (EPA415.1)	Total Non-Volatile Suspended Solids (mg/L) (EPA160.4)	Total Dissolved Solids (mg/L) (EPA160.1)	Total Alkalinity (mg/L) (SM2320)	Total Alkalinity (mg/L) (EPA310.2)	Sulfate (mg/L) (EPA300.0)	Temperature, water (deg C) (TEMP THERM)	Silicon (ug/L) (EPA200.7)	Phosphorus (mg/L) (SM4500PI)
ML3	4/25/01	10:06	6										10.68		
ML3	4/25/01	10:07	7										10.5		
ML3	4/25/01	10:08	8										10.12		
ML3	4/25/01	10:13	9										9.3		
ML3	4/25/01	10:15	10										9.25		
ML3	4/25/01	10:20	0.5	9.25 J		0.14	2.6		136.5 J		117.5				0.016
ML3	4/25/01	10:40	3	16 J		0.141	2.6		134		106				0.019
ML3	4/25/01	10:50	6	19.9 J		0.154	1.9		148		111				0.019
ML3	4/25/01	11:00	9	14.3 J		0.389	2.4		153		121				0.028
ML3	4/25/01	11:30	0.4	8.4 J		0.122									0.015
ML3	8/1/01	18:45	4.5			0.426	3.4 J		173	133					0.041
ML3	8/1/01	9:05	0.4	11.2 J		0.328									0.02
ML3	8/1/01	9:24	0.5										21.96		
ML3	8/1/01	9:25	1										21.98		
ML3	8/1/01	9:26	2										21.95		
ML3	8/1/01	9:27	3										21.87		
ML3	8/1/01	9:28	4										21.84		
ML3	8/1/01	9:28	5										21.8		
ML3	8/1/01	9:29	6										21.68		
ML3	8/1/01	9:29	7										20.78		
ML3	8/1/01	9:30	8										20.13		
ML3	8/1/01	9:31	9										19.13		
ML3	8/1/01	9:32	10										18.25		
ML3	8/1/01	9:45	0.5	12.1 J	4	0.301	3.8 J	2	167	125					0.015 U
ML3	8/1/01	10:10	3	12	4	0.2975	3.8 J	2	170	125					0.0165 U
ML3	8/1/01	10:30	6	13.3	4	0.308	4 J	2	165	125					0.017
ML3	8/1/01	10:45	9	4.68	3	1.0815	3.1 J	1	192	137	13				0.1435
ML3	8/1/01		0.5	11.8 J	5	0.295	3.7 J	2	161	125					0.0255
ML3	8/14/01	16:03	0.5										27.23		
ML3	8/14/01		1										26.4		
ML3	8/14/01		10										19.75		
ML3	8/14/01		2										25.85		
ML3	8/14/01		3										23.48		
ML3	8/14/01		4										23.33		
ML3	8/14/01		5										22.41		
ML3	8/14/01		6										22.03		
ML3	8/14/01		7										21.59		
ML3	8/14/01		8										21.1		
ML3	8/14/01		9										20.19		
ML3	8/15/01	18:20	0.5										27.95		
ML3	8/15/01	9:50	0.5										25.69		
ML3	8/15/01		1										26.205		
ML3	8/15/01		10										19.28		
ML3	8/15/01		2										25.72		
ML3	8/15/01		3										24.41		
ML3	8/15/01		4										23.31		
ML3	8/15/01		5										22.625		
ML3	8/15/01		6										22.09		
ML3	8/15/01		7										21.535		
ML3	8/15/01		8										21.16		
ML3	8/15/01		9										20.245		
ML3	8/16/01	18:00	0.5										27.83		
ML3	8/16/01		0.3										28.22		

Table B-1 - page 12. Field and Laboratory Data

Phosphorus (mg/L) (SM4500PH)	Phosphorus (mg/L) (EPA365.1)	pH (pH) (WASPH)	Ortho-Phosphate (mg/L) (SM4500PG)	Ortho-Phosphate (mg/L) (EPA365.3M)	Nitrite-Phosphate (mg/L) (SM4500NO3I)	Dissolved Oxygen (mg/L) (DOFM)	Dissolved Organic Carbon (mg/L) (EPA415.1)	Turbidity (NTU) (SM2130)	Conductivity (umhos/cm) (EPA20.1)	Conductivity (umhos/cm) (CONDIMETER)	Chloride (mg/L) (EPA300.0)	Flow (cfs) (MIDSECTION)	Ammonia (mg/L) (SM4500NH3H)	Ammonia (mg/L) (EPA350.1)
	9.19					11.54								
	9.12					11.02								
	9.04					9.01								
	8.48					4.78								
	8.23					4.05								
		0.005 U	0.01 U			2.15	3.2	265		213		4.705		0.01 U
		0.005 U	0.01 U			2	4	239		211		3.75		0.01 U
		0.005 U	0.01 U			3.4	5					4.13		0.01 U
		0.005	0.015			2.1						4.54		0.198
		0.005 U	0.01 U											0.01 U
		0.019		0.011		2.6 J	4.8					3.89		0.096
		0.006		0.01 U										0.024
	8.64					7.16						275		
	8.65					7.12						275		
	8.63					7.1						275		
	8.61					6.9						275		
	8.6					6.83						274		
	8.59					6.83						276		
	8.58					6.82						271		
	8.08					1.52						285		
	7.81					0.25						290		
	7.61					0.21						309		
	7.47					0.19						322		
		0.005		0.01 U		3.2 J	3.3	277				3.83		0.021
		0.005		0.01 U		3.3 J	4.4	277				3.83		0.025
		0.006		0.01 U		3.1 J	3.6					3.82		0.032
		0.127		0.01 U		3 J						3.64		0.697
		0.006		0.01 U		3.1 J	3.3	276				3.83		0.021
	8.77					10.2						256		
	8.81					10.7						255		
	7.46					0.19						303		
	8.79					10.72						255		
	8.8					10.69						258		
	8.69					6.91						265		
	8.17					3.86						273		
	7.91					1.58						275		
	7.76					0.49						274		
	7.71					0.26						279		
	7.56					0.21						294		
	8.75					10.54						253		
	8.8					10.16						256		
	8.775					10.41						254.5		
	7.27					0.17						320		
	8.785					10.63						254.5		
	8.79					10.54						255.5		
	8.425					6.38						269		
	8.01					2.08						274.5		
	7.79					1.07						276.5		
	7.71					0.205						278.5		
	7.67					0.185						280.5		
	7.525					0.18						293.5		
	8.76					10.72						252		
	8.74					10.77						254		

Table B-1 - page 13. Field and Laboratory Data

station	date	time	depth (m)	Chlorophyll (ug/L) (SM10200H3M)	Total Suspended Solids (mg/L) (EPA160.2)	Total Persulfate Nitrogen (mg/L) (SM4500NB)	Total Organic Carbon (mg/L) (EPA415.1)	Total Non-Volatile Suspended Solids (mg/L) (EPA160.4)	Total Dissolved Solids (mg/L) (EPA160.1)	Total Alkalinity (mg/L) (SM2320)	Total Alkalinity (mg/L) (EPA310.2)	Sulfate (mg/L) (EPA300.0)	Temperature, water (deg C) (TEMP THERM)	Silicon (ug/L) (EPA200.7)	Phosphorus (mg/L) (SM4500PI)
ML3	8/16/01		1										26.68		
ML3	8/16/01		2										25.93		
ML3	8/16/01		3										24.3		
ML3	8/16/01		4										23.71		
ML3	8/16/01		5										22.64		
ML3	8/16/01		6										22.17		
ML3	8/16/01		7										21.54		
ML3	8/16/01		8										21.06		
ML3	8/16/01		9										20.69		
ML3	8/29/01	9:15	0.4	9.8 J		0.331								0.016	
ML3	8/29/01	9:30	0.5										23.11		
ML3	8/29/01	10:00	0.5	12 J	7	0.2665	3.5	5	154	119				0.013 U	
ML3	8/29/01	10:13	3	30.2 J	10	0.2525	3.8	7	158	117				0.015 U	
ML3	8/29/01	10:27	3	28.2 J	12	0.262	3.7	7	152	115				0.0135 U	
ML3	8/29/01	10:38	6	20.2 J	6	0.398	3	3	176	122				0.0165	
ML3	8/29/01	10:54	9	4.8 J	4	0.79	2.9	2	138	132				0.092	
ML3	8/29/01		1										23.07		
ML3	8/29/01		10										20.1		
ML3	8/29/01		2										23		
ML3	8/29/01		3										21.7		
ML3	8/29/01		4										21.4		
ML3	8/29/01		5										21.27		
ML3	8/29/01		6										21.16		
ML3	8/29/01		7										21.03		
ML3	8/29/01		8										20.89		
ML3	8/29/01		9										20.76		
ML3	7/2/01	9:42	0.4	5.1											
ML3	7/2/01	9:50	0.5										21.75		
ML3	7/2/01	10:15	0.5	5		0.16	3.3		160	122				0.012	
ML3	7/2/01	10:20	3	8		0.154	3.5		157	121				0.013	
ML3	7/2/01	10:35	6	6.5		0.189	3.2		157	120				0.022	
ML3	7/2/01	10:35	9	1.8		0.565	3		159	124				0.105	
ML3	7/2/01		1										21.5		
ML3	7/2/01		10										16.93		
ML3	7/2/01		2										21.29		
ML3	7/2/01		3										21.17		
ML3	7/2/01		4										21.03		
ML3	7/2/01		5										19.66		
ML3	7/2/01		6										19.23		
ML3	7/2/01		7										18.58		
ML3	7/2/01		8										18.05		
ML3	7/2/01		9										17.49		
ML3	3/28/01	8:41	0												
ML3	3/28/01	8:42	0.5										8.16		
ML3	3/28/01	8:43	1.5										8.16		
ML3	3/28/01	8:43	3										8.16		
ML3	3/28/01	8:44	4.5										8.14		
ML3	3/28/01	8:44	6										8.14		
ML3	3/28/01	8:47	7.5										7.6		
ML3	3/28/01	8:51	9										7.3		
ML3	3/28/01	10:55	0.5										4.84		
ML3	3/29/01	9:00	0.5	38.2		0.482	3		217	164					
ML3	3/29/01	9:10	3	40		0.466	3		223	163					

Table B-1 - page 14. Field and Laboratory Data

Phosphorus (mg/L) (SM4500PH)	Phosphorus (mg/L) (EPA365.1)	pH (pH) (WASPH)	Ortho-Phosphate (mg/L) (SM4500PG)	Ortho-Phosphate (mg/L) (EPA365.3M)	Nitrite-Phosphate (mg/L) (SM4500NO3I)	Dissolved Oxygen (mg/L) (DOFM)	Dissolved Organic Carbon (mg/L) (EPA415.1)	Turbidity (NTU) (SM2130)	Conductivity (umhos/cm) (EPA20.1)	Conductivity (umhos/cm) (CONDIMETER)	Chloride (mg/L) (EPA300.0)	Flow (cfs) (MIDSECTION)	Ammonia (mg/L) (SM4500NH3H)	Ammonia (mg/L) (EPA350.1)
		8.8				11.2								
		8.87				12.17								
		8.63				8.9								
		8.46				7.32								
		8.11				3.33								
		7.86				0.79								
		7.72				0.21								
		7.65				0.18								
		7.55				0.16								
		0.005 U			0.01 U							0.01 U		
		9			12.19				243					
		0.005 U			0.01 U		3.5	4.4	258		3.89	0.01 U		
		0.005 U			0.01 U		3.1	5.2	257		3.65	0.01 U		
		0.005 U			0.01 U		2.8	5.7	256		3.57	0.01 U		
		0.005 U			0.013		2.5	3.1			3.61	0.145		
		0.079			0.01 U		2.7				3.92	0.491		
		9			12.23				244					
		7.5			0.15				311					
		9			12.25				244					
		8.78			7.86				244					
		8.42			5.67				246					
		8.21			4.49				249					
		8.01			2.52				257					
		7.84			0.77				267					
		7.72			0.17				271					
		7.65			0.15				277					
		8.96			10.12				260					
		0.005 U			0.01 U		2.7 J	2.3	268		3.86	0.01 U		
		0.005 U			0.01 U		2.9 J	2.2	265		3.63	0.01 U		
		0.008			0.01 U		2.9 J	1.6			3.67	0.025		
		0.1			0.01 U		2.9				3.79	0.34		
		9			10.76				258					
		7.66			0.61				276					
		9.06			11.22				256					
		9.04			11.07				257					
		9.01			10.65				257					
		8.79			8.26				256					
		8.56			5.92				256					
		8.27			2.93				263					
		7.99			1.4				266					
		7.8			0.63				267					
					14.84									
		8.82			14.84				322					
		8.82			14.82				323					
		8.82			14.71				323					
		8.81			14.61				322					
		8.8			14.51				325					
		8.67			11.22				364					
		8.48			8.9				368					
		0.038		0.005 U	0.266		2.5	5.7	365		7.02		0.01 U	
		0.039		0.005 U	0.265		2.9	6	364		7.07		0.011	

Table B-1 - page 15. Field and Laboratory Data

station	date	time	depth (m)	Chlorophyll (ug/L) (SM10200H3M)	Total Suspended Solids (mg/L) (EPA160.2)	Total Persulfate Nitrogen (mg/L) (SM4500NB)	Total Organic Carbon (mg/L) (EPA415.1)	Total Non-Volatile Suspended Solids (mg/L) (EPA160.4)	Total Dissolved Solids (mg/L) (EPA160.1)	Total Alkalinity (mg/L) (SM2320)	Total Alkalinity (mg/L) (EPA310.2)	Sulfate (mg/L) (EPA300.0)	Temperature, water (deg C) (TEMP THERM)	Silicon (ug/L) (EPA200.7)	Phosphorus (mg/L) (SM4500PI)
ML3	3/29/01	9:20	6	38.6		0.474	2.8								
ML3	3/29/01	9:30	9	53.8		0.609	3.4 J								
ML3	5/30/01	12:05	0.4	6.9		0.201									0.018
ML3	5/30/01	12:15	0.5												18.03
ML3	5/30/01	12:16	1												18.03
ML3	5/30/01	12:17	2												17.95
ML3	5/30/01	12:17	3												17.45
ML3	5/30/01	12:18	4												16.82
ML3	5/30/01	12:18	5												16.76
ML3	5/30/01	12:19	6												16.45
ML3	5/30/01	12:20	7												15.85
ML3	5/30/01	12:21	8												15.4
ML3	5/30/01	12:22	10												15.08
ML3	5/30/01	12:22	9												15.26
ML3	5/30/01	12:25	0.5	7.2		0.22	2.5 J		148	114					0.028
ML3	5/30/01	12:35	3	6.4		0.27	2.5 J		151	115					0.036
ML3	5/30/01	12:45	6	4.1		0.348	2.4 J		153	112					0.057
ML3	5/30/01	12:55	9	3		0.606	2.5 J		157	123					0.11
ML3	9/26/01	8:32	0												
ML3	9/26/01	8:33	0.5												18.97
ML3	9/26/01	8:34	1												18.97
ML3	9/26/01	8:35	2												18.97
ML3	9/26/01	8:35	3												18.99
ML3	9/26/01	8:36	4												18.97
ML3	9/26/01	8:36	5												18.97
ML3	9/26/01	8:37	6												18.97
ML3	9/26/01	8:37	7												18.97
ML3	9/26/01	8:38	8												18.89
ML3	9/26/01	8:39	10												18.9
ML3	9/26/01	8:39	9												18.9
ML3	9/26/01	8:50	0.5	12.4 J	6	0.332 J	2.8	4	144	112					2890
ML3	9/26/01	9:10	3	12 J	7	0.3365 J	2.8	4	139	113					
ML3	9/26/01	9:20	6	13.6 J	6	0.3465 J	3	4	136	113					
ML3	9/26/01	9:35	9	13.15	11	0.331 J	3.1 J	8	141	113.5					2812.5
ML4	4/25/01	15:06	0.5												13.02
ML4	4/25/01	15:08	1												11.92
ML4	4/25/01	15:09	2												11.44
ML4	4/25/01	15:10	3												10.78
ML4	4/25/01	15:11	4												9.52
ML4	4/25/01	15:15	0.5	4.6 J		0.107	2.3		86 J		76.05				0.0125
ML4	4/25/01	15:35	3	15.3 J		0.144	3		112 J		98.1				0.024
ML4	8/1/01	17:50	0.4	18.5 J		0.286									0.023
ML4	8/1/01	18:07	0.5												22.76
ML4	8/1/01	18:08	1												22.76
ML4	8/1/01	18:09	2												22.68
ML4	8/1/01	18:10	3												22.52
ML4	8/1/01	18:13	4												21.8
ML4	8/1/01	18:16	4.9												21.45
ML4	8/1/01	18:25	0.5	28.5		0.298	3.6 J		171	132					0.026
ML4	8/1/01	18:30	3	20.1	7	0.2995	3.4 J	4	174	132					0.022
ML4	8/29/01	16:20	0.4	7.2		0.227									0.014
ML4	8/29/01	16:26	0.5												25.18
ML4	8/29/01	16:35	0.5	7		0.236	3.4		145	105					0.015

Table B-1 - page 16. Field and Laboratory Data

Phosphorus (mg/L) (SM4500PH)	Phosphorus (mg/L) (EPA365.1)	pH (pH) (WASPH)	Ortho-Phosphate (mg/L) (SM4500PG)	Ortho-Phosphate (mg/L) (EPA365.3M)	Nitrite-Phosphate (mg/L) (SM4500NO3I)	Dissolved Oxygen (mg/L) (DOFM)	Dissolved Organic Carbon (mg/L) (EPA415.1)	Turbidity (NTU) (SM2130)	Conductivity (umhos/cm) (EPA20.1)	Conductivity (umhos/cm) (CONDIMETER)	Chloride (mg/L) (EPA300.0)	Flow (cfs) (MIDSECTION)	Ammonia (mg/L) (SM4500NH3H)	Ammonia (mg/L) (EPA350.1)
0.039				0.005 U	0.268		2.4	6.1			7.03			0.013
0.045				0.005 U	0.297		2.5				8.34			0.098
	0.01		0.015									0.045		
8.65					8.63				241					
8.65					8.62				241					
8.64					8.45				246					
8.58					7.94				251					
8.42					7.14				230					
8.34					6.95				230					
8.24					5.91				241					
8.07					4.3				255					
7.97					4.08				256					
7.85					2.51				261					
7.4					3.98				256					
	0.01		0.014		2.3 J	2	255		3.62		0.045			
	0.014		0.013		2.3 J	2.1	257		3.66		0.079			
	0.032		0.019		2.1 J	2.8			3.37		0.157			
	0.073		0.01 U		2.3 J				3.92		0.35			
				7.77										
8.69				7.73				245						
8.69				7.69				246						
8.68				7.72				246						
8.69				7.67				246						
8.68				7.66				246						
8.69				7.62				246						
8.69				7.65				246						
8.68				7.62				246						
8.65				7.43				247						
8.64				7.33				248						
8.64				7.4				248						
0.0325 J		0.0039		0.01		2.7	3.9	248		3.52		0.037		
0.019 UJ		0.0036		0.01		2.5	4.4	250		3.48		0.04		
0.017 UJ		0.0039		0.01 U		2.5	4.1			3.44		0.038		
0.022 UJ		0.00475		0.01 U		2.6	7.4			3.485		0.054		
	8.95				12.25			152						
	9.01				12.41			157						
	9.13				12.54			181						
	9.18				12.53			211						
	8.97				12.05			146.5						
		0.005 U	0.0235			1.9	2.05	172.5		1.71		0.01 U		
		0.005 U	0.01 U			2.6	3.8	220		3.07		0.01 U		
		0.005 U		0.01 U							0.01 UJ			
	8.92				10.39			285						
	8.92				10.18			285						
	8.85				9.27			286						
	8.7				8.17			287						
	8.46				3.74			294						
	8.03				2.41			296						
		0.006		0.01 U		2.7 J	4.5	288		3.8		0.01 UJ		
		0.011		0.01 U		3.1 J	4.4	288		3.86		0.04		
		0.005 U		0.022								0.01 U		
	8.95				12.08			216						
		0.005 U		0.01 U		3.4	2.2	230		2.82		0.01 U		

Table B-1 - page 17. Field and Laboratory Data

station	date	time	depth (m)	Chlorophyll (ug/L) (SM10200H3M)	Total Suspended Solids (mg/L) (EPA160.2)	Total Persulfate Nitrogen (mg/L) (SM4500NB)	Total Organic Carbon (mg/L) (EPA415.1)	Total Non-Volatile Suspended Solids (mg/L) (EPA160.4)	Total Dissolved Solids (mg/L) (EPA160.1)	Total Alkalinity (mg/L) (SM2320)	Total Alkalinity (mg/L) (EPA310.2)	Sulfate (mg/L) (EPA300.0)	Temperature, water (deg C) (TEMP THERM)	Silicon (ug/L) (EPA200.7)	Phosphorus (mg/L) (SM4500Pi)
ML4	8/29/01	16:46	3	52.9	11	0.2145	3.9								0.0115 U
ML4	8/29/01		1												23.6
ML4	8/29/01		2												21.96
ML4	8/29/01		3												21.4
ML4	8/29/01		4												21.13
ML4	8/29/01		5												20.41
ML4	7/2/01	15:55	0.4	7.2											
ML4	7/2/01	15:55	0.5												23.96
ML4	7/2/01	16:05	0.5	7.1		0.164	3.2		146	115					0.014
ML4	7/2/01	16:10	3	5.3		0.138	3.3		153	119					0.013
ML4	7/2/01	16:20	4.5	9		0.156	3.2		155	118					0.021
ML4	7/2/01		1												23.04
ML4	7/2/01		2												21.08
ML4	7/2/01		3												20.03
ML4	7/2/01		4												19.63
ML4	7/2/01		5												18.58
ML4	3/28/01	10:55	0.5												
ML4	3/28/01	10:56	1.5												4.87
ML4	3/28/01	10:57	3												4.77
ML4	3/29/01	11:05	0.5	7.95		0.1315	2		87.5	67.6					
ML4	3/29/01	11:25	3	8.1		0.13	1.8		85	67.9					0.013
ML4	5/30/01	15:00	0.4	6.3		0.192									
ML4	5/30/01	15:10	0												
ML4	5/30/01	15:11	0.5												17.28
ML4	5/30/01	15:12	1												17.26
ML4	5/30/01	15:12	2												17.16
ML4	5/30/01	15:13	3												17.06
ML4	5/30/01	15:14	4												16.25
ML4	5/30/01	15:15	5												14.8
ML4	5/30/01	15:20	0.5	7.25		0.1315	2.2 J		121.5	91.9					0.0155
ML4	5/30/01	15:40	3	7		0.142	2.25 J		118	92.5					0.0205
ML4	5/30/01	15:55	4.5				1.9 J		110	83.6					
ML4	9/26/01	14:24	0.5												17.74
ML4	9/26/01	14:24	1												17.74
ML4	9/26/01	14:25	2												17.72
ML4	9/26/01	14:26	3												17.71
ML4	9/26/01	14:26	4												17.57
ML4	9/26/01	14:27	4.9												17.35
ML4	9/26/01	14:30	0.5	6.6	13	0.226 J	2	9	126	93					
ML4	9/26/01	14:40	3	6.5	4	0.193 J	1.8	3	122	92.7					4240
ML5	4/25/01	15:54	0.5												13.8
ML5	4/25/01	15:55	1												12.74
ML5	4/25/01	15:56	2												11.16
ML5	4/25/01	16:00	0.5	1.9 J		0.159	1.8		75 J	72.4					0.014
ML5	4/25/01	16:10	1.5	4.5 J		0.171	2.2		83 J	72.4					0.016
ML5	8/1/01	19:09	0.5												23.17
ML5	8/1/01	19:10	1												23.2
ML5	8/1/01	19:11	2												21.78
ML5	8/1/01	19:15	0.5	41.9	14	0.3055	3.5 J	8	176	135					0.0225
ML5	8/29/01	17:08	0.5												23.05
ML5	8/29/01	17:15	0.5	8.4	4	0.355	1.7	3	124	92					0.02
ML5	8/29/01		1												22.3
ML5	8/29/01		2												21.54

Table B-1 - page 18. Field and Laboratory Data

Phosphorus (mg/L) (SM4500PH)	Phosphorus (mg/L) (EPA365.1)	pH (pH) (WASPH)	Ortho-Phosphate (mg/L) (SM4500PG)	Ortho-Phosphate (mg/L) (EPA365.3M)	Nitrite-Nitrate (mg/L) (SM4500NO3I)	Dissolved Oxygen (mg/L) (DOFM)	Dissolved Organic Carbon (mg/L) (EPA415.1)	Turbidity (NTU) (SM2130)	Conductivity (umhos/cm) (EPA120.1)	Conductivity (umhos/cm) (CONDIMETER)	Chloride (mg/L) (EPA300.0)	Flow (cfs) (MIDSECTION)	Ammonia (mg/L) (SM4500NH3H)	Ammonia (mg/L) (EPA350.1)
			0.005 U		0.01 U		2.3	4.2	244		3.07		0.01 U	
9.03					13.44					229				
8.97					12.26					226				
8.82					10.41					230				
8.57					7.9					227				
8.23					5.21					209				
					11.26					243				
	0.005 U			0.03		2.9	2.1	251		2.91		0.01 U		
	0.005 U			0.01 U		3.1	2.6	260		3.46		0.01 U		
	0.008			0.01 U		2.8	4.2			3.32		0.012		
8.92					10.88					246				
8.94					11.17					249				
8.89					10.63					252				
8.83					9.3					253				
8.16					2.33					249				
8.32					15.12					129.5				
8.3					15.06					129.6				
8.28					15.05					129.9				
0.0195			0.005 U	0.04		1.6	2.15	153.5		1.245			0.01 U	
0.019			0.005 U	0.038		2.3	2.3	155		1.22			0.01 U	
		0.006		0.032								0.02		
					9.57									
8.66					9.57					196				
8.66					9.6					196				
8.66					9.57					195				
8.65					9.6					192				
8.58					9.68					182				
8.43					9.71					159				
	0.005 U			0.03		1.85 J	2.35	205.5		2.11		0.0105 U		
	0.006			0.0305		1.85 J	2.3	206.5		2.07		0.0135		
	0.005					1.8 J				1.7				
8.67					9.41					203				
8.67					9.5					202				
8.67					9.5					202				
8.66					9.3					203				
8.64					9.18					203				
8.57					8.95					205				
0.017 J		0.0041		0.073		1.8	2.4	208		2.04		0.01 U		
0.0135 UJ		0.0044		0.073		1.9	2.4	207		2.08		0.01 U		
	8.56				11.61					146				
	8.69				12.47					143				
	8.76				13.01					145				
		0.005 U	0.08		2.2	1	165			1.29			0.01 U	
		0.005 U	0.088		2.2	1.9	165			1.41			0.01 U	
	9.03				14.8					286				
	9.03				14.65					286				
	8.79				12.59					318				
	0.007		0.025		3 J	7.5	292			3.45		0.01 UJ		
	8.46				10.2					194				
	0.008		0.206		1.6	2.6	206			1.63		0.01 U		
	8.47				10.56					190				
	8.58				11.45					190				

Table B-1 - page 19. Field and Laboratory Data

station	date	time	depth (m)	Chlorophyll (ug/L) (SM10200H3M)	Total Suspended Solids (mg/L) (EPA160.2)	Total Persulfate Nitrogen (mg/L) (SM4500NB)	Total Organic Carbon (mg/L) (EPA415.1)	Total Non-Volatile Suspended Solids (mg/L) (EPA160.4)	Total Dissolved Solids (mg/L) (EPA160.1)	Total Alkalinity (mg/L) (SM2320)	Total Alkalinity (mg/L) (EPA310.2)	Sulfate (mg/L) (EPA300.0)	Temperature, water (deg C) (TEMP THERM)	Silicon (ug/L) (EPA200.7)	Phosphorus (mg/L) (SM4500PI)
ML5	7/2/01	16:40	0.5										24.68		
ML5	7/2/01	16:50	0.5	15		0.352	3.4								0.026
ML5	7/2/01	16:55	1.5	9.9		0.619	2.6								0.038
ML5	7/2/01		1												24.42
ML5	7/2/01		2												21.79
ML5	3/29/01	11:58	0.5												5.77
ML5	3/29/01	11:59	1												5.77
ML5	3/29/01	12:05	0.5	10.9		0.126	2.1			91		64.8			16.03
ML5	5/30/01	16:24	0.5												16
ML5	5/30/01	16:25	1												16
ML5	5/30/01	16:25	2												16
ML5	5/30/01	16:30	0.5	3.7		0.141	1.6 J			95	71.5				0.011
ML5	5/30/01	16:40	1.5				1.6 J			102	78				
ML5	9/6/01	15:04	1												17.03
ML5	9/26/01	15:03	0.5												17.06
ML5	9/26/01	15:04	1												
ML5	9/26/01	15:08	2												17.01
ML5	9/26/01	15:10	0.5	2.1	3	0.285 J	1.9	2	117	86				4470	
ML6	4/25/01	9:08	0.5												13.92
ML6	4/25/01	9:09	1												13.74
ML6	4/25/01	9:10	2												13.26
ML6	4/25/01	9:10	3												10.62
ML6	4/25/01	9:11	4												10.54
ML6	4/25/01	9:25	0.5	14.7 J		0.169	3.1			145 J	124				0.018
ML6	4/25/01	9:35	3	23.5 J		0.17	3.3			144 J	121				0.021
ML6	8/1/01	11:10	0.4	9.37		0.27									0.019
ML6	8/1/01	11:31	0.5												22.56
ML6	8/1/01	11:32	1												22.5
ML6	8/1/01	11:33	2												22.09
ML6	8/1/01	11:33	3												21.91
ML6	8/1/01	11:34	4												21
ML6	8/1/01	11:40	0.5	7.66		0.283	3.7 J			166	125				0.022
ML6	8/1/01	11:55	3	11.5	6	0.266	3.9 J	4	163	124					0.016 U
ML6	8/29/01	11:28	0.4	8.4		0.302									0.018
ML6	8/29/01	11:53	0.5												23.65
ML6	8/29/01		1												23.44
ML6	8/29/01		2												23.24
ML6	8/29/01		3												21.54
ML6	8/29/01		4.9												21.08
ML6	8/29/01		4												21.22
ML6	8/29/01	12:00	0.5	8.8		0.303	3.4			163	124				0.019
ML6	8/29/01	12:10	3	21.7	8	0.2955	3.5	5	160	126					0.0165
ML6	7/2/01	11:14	0.4	5.8											
ML6	7/2/01	11:20	0.5												22.97
ML6	7/2/01	11:30	0.5	5.8		0.159	3.2			162	123				0.014
ML6	7/2/01	11:35	3	7.1		0.16				160	123				0.015
ML6	7/2/01		1												22.7
ML6	7/2/01		2												22.25
ML6	7/2/01		3												21.33
ML6	7/2/01		4.5												18.89
ML6	7/2/01		4												19.35
ML6	3/28/01	10:04	0.5												7.98
ML6	3/28/01	10:05	1.5												7.93

Table B-1 - page 20. Field and Laboratory Data

Phosphorus (mg/L) (SM4500PH)	Phosphorus (mg/L) (EPA365.1)	pH (pH) (WASPH)	Ortho-Phosphate (mg/L) (SM4500PG)	Ortho-Phosphate (mg/L) (EPA365.3M)	Nitrite-Phosphate (mg/L) (SM4500NO3I)	Dissolved Oxygen (mg/L) (DOFM)	Dissolved Organic Carbon (mg/L) (EPA415.1)	Turbidity (NTU) (SM2130)	Conductivity (umhos/cm) (EPA120.1)	Conductivity (umhos/cm) (CONDIMETER)	Chloride (mg/L) (EPA300.0)	Flow (cfs) (MIDSECTION)	Ammonia (mg/L) (SM4500NH3H)	Ammonia (mg/L) (EPA350.1)
		8.72				10.48								
		0.016			0.193		3	3.1	266		2.54		0.02	
		0.017			0.403		2.4	6.9	299		2.85		0.063	
		8.71				10.69				256				
		8.61				12.06				294				
		8.15				15.58				125				
		8.16				15.47				125				
0.021			0.005 U	0.034		1.5	4	148		1.05				0.01 U
		8.45				10.8				152				
		8.46				10.78				151				
		8.46				10.77				152				
		0.005 U			0.079		1.5 J	2.7	162		1.03		0.01 U	
		0.005 U					1.6 J		165		1.09			
		8.72				12.12				186				
		8.76				12.36				187				
		8.84				12.21				186				
0.0115 UJ		0.0074		0.154		1.5	1.2	192		1.51		0.01 U		
		9.4				12.08				249				
		9.41				12.19				248				
		9.42				12.32				248				
		9.36				12.15				228				
		9.29				11.74				230				
		0.005 U	0.01 U			2.3	5.2	276		5.4				0.01 U
		0.005 U	0.01 U			2.1	6.4	266		4.82				0.01 U
		0.005 U		0.01 U									0.01 UJ	
		8.75				7.9				273				
		8.74				7.85				274				
		8.72				7.94				274				
		8.69				7.86				274				
		8.24				3.49				280				
		0.005 U		0.01 U		3.4 J	4.3	276		3.9		0.01 UJ		
		0.005 U		0.01 U		3.2 J	4.6	274		4.05		0.01 UJ		
		0.005 U		0.01 U								0.01 U		
		8.89				10.66				255				
		8.89				10.48				255				
		8.89				10.21				255				
		8.35				4.8				263				
		7.86				0.72				269				
		7.98				1.97				268				
		0.005 U		0.01 U		3.1	4.9	271		4.21		0.01 U		
		0.005 U		0.01 U		2.8	5.3	275		3.94		0.037		
		8.82				9.31				262				
		0.005 U	0.01 U			2.8	2.8	272		3.82		0.01 U		
		0.005 U		0.01 U			3.5	271		3.71		0.01 U		
		8.82				9.3				262				
		8.83				9.49				262				
		8.8				8.95				262				
		8.17				3.92				262				
		8.5				5.27				262				
		8.87				15.94				353				
		8.88				15.79				351				

Table B-1 - page 21. Field and Laboratory Data

station	date	time	depth (m)	Chlorophyll (ug/L) (SM10200H3M)	Total Suspended Solids (mg/L) (EPA160.2)	Total Persulfate Nitrogen (mg/L) (SM4500NB)	Total Organic Carbon (mg/L) (EPA415.1)	Total Non-Volatile Suspended Solids (mg/L) (EPA160.4)	Total Dissolved Solids (mg/L) (EPA160.1)	Total Alkalinity (mg/L) (SM2320)	Total Alkalinity (mg/L) (EPA310.2)	Sulfate (mg/L) (EPA300.0)	Temperature, water (deg C) (TEMP THERM)	Silicon (ug/L) (EPA200.7)	Phosphorus (mg/L) (SM4500Pi)
ML6	3/28/01	10:06	3										7.89		
ML6	3/29/01	10:10	0.5	50.2		0.484	3.6								
ML6	3/29/01	10:20	3	52		0.486	3.8		243		181				
ML6	5/30/01	13:10	0.4	10.3		0.181					180				0.016
ML6	5/30/01	13:26	0.5												18.15
ML6	5/30/01	13:26	1												18.12
ML6	5/30/01	13:27	2												18.12
ML6	5/30/01	13:27	3												18.03
ML6	5/30/01	13:27	4												16.72
ML6	5/30/01	13:30	0.5	10.3		0.156	2.6 J		156	120					0.016
ML6	5/30/01	13:40	3	10.3		0.162	2.7 J		159	120					0.021
ML6	9/26/01	10:29	0.5												18.71
ML6	9/26/01	10:30	1												18.71
ML6	9/26/01	10:30	2												18.71
ML6	9/26/01	10:31	3												18.7
ML6	9/26/01	10:31	4												18.63
ML6	9/26/01	10:35	0.5	13.3	8	0.3 J	2.8	5	142	116					
ML6	9/26/01	10:40	3	13.2	8	0.3285 J	3	5	151	116					2975
ML7	4/23/01	13:35	0	15.2 J		0.138	2.5		123 J						10.98
ML7	8/27/01	15:20	0	28.4 J	7	0.262	3.7	2	155						22.43
ML7	7/30/01	17:00	0	11.3 J		0.264	3 J		162						23.32
ML7	6/25/01	15:20	0	5.4 J		0.22	3		157						0.024
ML8	8/1/01		0.5	9.14		0.337									0.034
ML8	8/29/01	11:40	0.5	9		0.235									0.032
ML8	9/26/01	11:05	0.5			0.227 J									
RC1	4/24/01	15:45	0	1.9	2	0.074	1.4		65 J		60.3				9.27
RC1	8/28/01	11:10	0	1.7 J	15	0.115	1.8		93	68.1					19.4
RC1	7/31/01	11:00	0	2.69 J	2	0.655	1.9 J		170	124					0.024
RC1	7/31/01	12:40	0												19.73
RC1	6/26/01	16:15	0	2	1 U	0.083	1.7		92	67.1					17.71
RC1	3/26/01	12:25	0	12.2	8	0.117	1.9		82		61.8				5.12
RC1	5/29/01	11:50	0	1.3	3	0.071	1.3 J		84	62.2					14.1
RC1	9/25/01	15:10	0	2.2	2	0.128 J	1.4	1 U	91	67.5					0.013
RC2	4/24/01	15:15	0		2	0.051	1.4		64 J		58.5				0.01
RC2	4/24/01		0												10.3
RC2	8/28/01	12:40	0		2	0.06	1.5			62.4					19.7
RC2	7/31/01	11:00	0												18.03
RC2	7/31/01	12:40	0	1.39	3	0.11	1.9 J			65.9					0.01 U
RC2	6/26/01	15:50	0	2	1	0.061	1.6			64.2					18.15
RC2	3/26/01	12:50	0		4	0.0865	1.7		72.5 J		59.9				4.99
RC2	5/29/01	13:15	0		1	0.053				60.7					0.013
RC2	5/29/01	13:35	0												14.63
RC2	9/25/01	14:20	0	2.2	1	0.083 J	1.5	1 U	80	62.8					17.57
RFO	4/23/01	15:50	0		21	1.57			248 J		171				14.75
RFO	4/24/01	8:00	0	5.25 J	11.5	1.38	1.8		244.5 J		172				0.152
RFO	8/27/01	16:10	0												21.01
RFO	8/27/01	18:00	0		12	1.37		10	248	163					0.122
RFO	8/28/01	9:00	0	4.15 J	18	1.35	1.7	15	250.5	164.5					0.11725
RFO	7/30/01	18:30	0		9	1.28		8	248	166					0.118
RFO	7/31/01	9:05	0	7.315 J	17.5	1.265	1.65 J	14.5	249.5	167					0.11175
RFO	6/25/01	16:10	0		6	1.18			254	170					0.103
RFO	6/26/01	8:10	0	5.95 J	21	1.21	1.85		256	171					0.1085
RFO	3/26/01	8:55	0	7.5 J	13	1.66	2.2		239		172				11.15

Table B-1 - page 22. Field and Laboratory Data

Phosphorus (mg/L) (SM4500PH)	Phosphorus (mg/L) (EPA365.1)	pH (pH) (WASPH)	Ortho-Phosphate (mg/L) (SM4500PG)	Ortho-Phosphate (mg/L) (EPA365.3M)	Nitrite-Phosphate (mg/L) (SM4500NO3I)	Dissolved Oxygen (mg/L) (DOFM)	Dissolved Organic Carbon (mg/L) (EPA415.1)	Turbidity (NTU) (SM2130)	Conductivity (umhos/cm) (EPA120.1)	Conductivity (umhos/cm) (CONDIMETER)	Chloride (mg/L) (EPA300.0)	Flow (cfs) (MIDSECTION)	Ammonia (mg/L) (SM4500NH3H)	Ammonia (mg/L) (EPA350.1)
		8.87				15.62				354				
0.039			0.005 U	0.249		2.7	8.8	399		8.48			0.01 U	
0.041			0.005 U	0.248		2.6	9.1	399		8.46			0.01 U	
		0.005 U		0.01 U									0.01	
8.8					9.18				255					
8.8					9.18				255					
8.8					9.15				255					
8.79					9.08				255					
8.5					6.68				254					
		0.005 U		0.01 U		2.4 J	2.7	266		3.98		0.011		
		0.005 U		0.01 U		2.4 J	3	266		4		0.015		
8.74					8.01				250					
8.75					8.01				252					
8.75					7.94				252					
8.74					7.94				250					
8.74					7.94				250					
0.026 J		0.003 U		0.01 U		2.7	4.4	255		3.44		0.014		
0.0195 J		0.003 U		0.01 U		2.6	4.6	255		3.36		0.013		
	9.11	0.005 U	0.01 U	12.52	2				209	3.57			0.01 U	
8.95	0.005 U		0.01 U	11.45	2.5				245	3.63		0.01 U		
8.95	0.005 U		0.01 U	9.14	2.5 J				269	3.82		0.01		
	0.01		0.01 U		2.8					3.59		0.039		
			0.01 U									0.01 UJ		
		0.005 U		0.01 U								0.01 U		
0.026 J	0.0038		0.01 U									0.01 U		
	8.42	0.005 U	0.014	11.87	1.6	0.8	139	120.6	0.854				0.01 U	
	8.2	0.005 U		0.048	9.57	1.8	0.7	159	148	1.15		0.01 U		
		0.016		0.574		1.8 J	0.9	274		2.46		0.01 U		
	6.26				9.31				151					
	8.45	0.005 U		0.021	14.97	1.7	0.7	156	137.3	1.02		0.01 U		
0.018	8.11	0.005 U	0.023		1.7	2.8	142	120.4	1.02				0.01 U	
	8.32	0.005 U		0.017	10.72	1.3 J	1.1	143	133.4	0.763		0.01 U		
0.01 UJ	8.26	0.0041		0.048	9.55	1.4	0.7	157	153	1.08		0.01 U		
		0.005 U	0.01 U		1.5	0.7	135		0.787				0.01 U	
	8.13	0.005 U		0.01 U	9.38	1.9	0.6	145	130	0.889		0.01 U		
	8.66				12.18				270					
		0.005 U		0.036		1.5 J	1	154		0.971		0.01 U		
	8.37	0.005 U		0.01 U	9.93	1.7	0.7	149	137.2	0.917		0.01 U		
0.0135	7.61	0.005 U	0.01 U		1.65	1.65	136.5	116	0.9315				0.01 U	
		0.005 U		0.01 U			0.8	139		0.73		0.01 U		
	8.42				10.98				129.6					
0.01 UJ	8.26	0.003 U		0.01 U	9.89	1.6	0.8	146	141	0.921		0.01 U		
	8.71			1.33	11.14			408	372	8.16			0.091	
	8.23	0.0975	1.28	9.99	1.7	4.3	411	373	8.05				0.1065	
	8.95				10.36				220					
				1.23			389		6.57		0.036			
	7.97	0.097		1.19	7.87	1.75	6.75	390	367	6.235		0.056		
	8.62			1.09	10.35			389	385	6.78		0.029		
	8.09	0.092		1.11	8.46	1.4 J	5.2	394.5	389	6.405		0.038		
		0.07		1.02				390		6.7		0.018		
	8.04	0.069		1.05	8.68	1.9	7.95	398.5	372.2	6.585		0.029		
	0.16	8.2	0.121	1.43		2.2	4.9	414	371	7.57			0.103	

Table B-1 - page 23. Field and Laboratory Data

station	date	time	depth (m)	Chlorophyll (ug/L) (SM10200H3M)	Total Suspended Solids (mg/L) (EPA160.2)	Total Persulfate Nitrogen (mg/L) (SM4500NB)	Total Organic Carbon (mg/L) (EPA415.1)	Total Non-Volatile Suspended Solids (mg/L) (EPA160.4)	Total Dissolved Solids (mg/L) (EPA160.1)	Total Alkalinity (mg/L) (SM2320)	Total Alkalinity (mg/L) (EPA310.2)	Sulfate (mg/L) (EPA300.0)	Temperature, water (deg C) (TEMP THERM)	Silicon (ug/L) (EPA200.7)	Phosphorus (mg/L) (SM4500P)
RF0	5/29/01	8:35	0	4 J	18.5	1.405	1.9 J						13.77		0.1125
RF0	9/24/01	16:05	0	2.6	10	1.58 J	1.3							16350	
RF0	9/24/01	16:10	0										17.95		
RF0	9/24/01	11:45	0	3.7 J	5.5 U	1.61 J	1.45 J	4.5 U	248	163			16.4		
RF1	4/24/01	7:45	0		16	1.29							12		0.14
RF1	8/28/01	8:29	0		21	1.38							17.13		0.125
RF1	7/31/01	8:30	0		14	1.32							17.15		0.119
RF1	6/26/01	7:45	0		8	1.22							16.33		0.099
RF1	3/26/01	8:35	0		18	1.69									
RF1	3/26/01		0										11.4		
RF1	5/29/01	8:15	0		16	1.41							14.15		0.101
RF1A	9/24/01	15:50	0	3.4 J	5	2.05 J	1.4	4	275	172			17.54		
RF1A	9/24/01	11:20	0	3.6 J	10	2.04 J	1.3	8	274	172			15.48		
RF1B	9/24/01	15:25	0	3	1 U	3.27 J	1.4	1 U	275	171			16.37		
RF1B	9/24/01	10:40	0	3.9 J	11	3.27	1.4 J	9	271	172			14.11		
RF1C	9/24/01	14:15	0	3.6	7	3.84 J	1.4	5	268	171					
RF1C	9/24/01	8:40	0	3.3 J	7	2.91	1.3 J	6	275	171			13.02		
RF1C2	9/24/01	14:45	0	2.8	4	1.93 J	1.9	4	274	170			15.61		
RF2	4/24/01	7:10	0		2	1.77							11.44		0.117
RF2	8/28/01	7:30	0		2	2.21							13.78		0.125
RF2	7/31/01	7:55	0		2	2.13							13.71		0.129
RF2	6/26/01	7:10	0			2.02							13.88		0.119
RF2	3/26/01	7:25	0		2	1.96							12.3		
RF2	5/29/01	7:25	0		2	1.73							12.35		0.096
RF2	9/24/01	13:45	0	2.1	2	2.65 J	1.3	2	272	171			14.31		
RF2	9/24/01	9:45	0	2.6 J	12	3.61	1.1	10	270	172			12.93		
RF2	9/25/01	13:10	0			2.09 J									
RF2A	9/24/01	13:20	0	1.2	1 U	2.27	1.1 J	1 U	428 J	169			14.18		
RF2A	9/24/01	9:20	0	1 J	3	3.19	1 J	3	274	170			13.07		
RF3	4/24/01	6:40	0		1 U	2.51	1.1		287 J		220		12.6		0.098
RF3	8/28/01	6:45	0		1 U	3.13	1.1		448	312			14.8		0.11
RF3	7/31/01	7:00	0		1 U	3.9	1.2 J			310			14.2		0.119
RF3	6/26/01	6:35	0		1 U	2.65	1 J		275	193			14.61		0.111
RF3	5/29/01	6:45	0		1 U	2.61	1.2 J		291	206			13.26		0.075
RF3	9/24/01	6:50	0	0.05 UJ	3	3.95	1 U	2	276	198			14.25		
RF3A	9/24/01	7:15	0	0.05 UJ	1 U	3.22	1 U	1 U	259	158			13.53		
RF3B	9/24/01	7:30	0	0.05 UJ	1 U	3.04 J	1.2 J	1 U	279	168			12.64		
SP1	4/24/01	12:10	0			3.39					307				0.104
SP1	7/31/01	15:00	0		1 U	3.44	1.6 J		350	263			17.5		0.054
SP1	6/26/01	12:05	0	0.15	1 U	4.19	1.5		380	287			13.72		0.055
SP1	9/25/01	9:55	0	0.05 UJ	1 U	2.5 J	1.2		345	265					

Table B-1 - page 24. Field and Laboratory Data

Phosphorus (mg/L) (SM4500PH)	Phosphorus (mg/L) (EPA365.1)	pH (pH) (WASPH)	Ortho-Phosphate (mg/L) (SM4500PG)	Ortho-Phosphate (mg/L) (EPA365.3M)	Nitrite-Nitrate (mg/L) (SM4500NO3I)	Dissolved Oxygen (mg/L) (DOFM)	Dissolved Organic Carbon (mg/L) (EPA415.1)	Turbidity (NTU) (SM2130)	Conductivity (umhos/cm) (EPA120.1)	Conductivity (umhos/cm) (CONDIMETER)	Chloride (mg/L) (EPA300.0)	Flow (cfs) (MIDSECTION)	Ammonia (mg/L) (SM4500NH3H)	Ammonia (mg/L) (EPA350.1)
		8.36	0.078		1.205	9.63	1.6 J	6	405.5	385	7.305		0.0935	
0.106 J			0.1		1.39		1.2	3.7	388		5.86		0.031	
		8.27				10.15				386				
0.1075 J	8.15	0.103		1.41	9.72	1.25	3.75	390	387	5.975		0.042		
	8.17		0.097	1.31			5.4		366	8.02			0.102	
	7.92	0.1		1.22	7.72		6.6		369				0.045	
	8.05	0.094		1.14	8.35		4.2		388	6.66			0.033	
	7.98	0.068		1.07	8.09		3.3		372.1	6.46			0.013	
	0.164		0.125	1.46			6.3			7.59			0.107	
		8.24	0.076		1.22	9.6		4.9		386	7.25		0.082	
0.128 J	8.06	0.125		1.82	10.37	1.3	4.1	425	424	8.07		0.057		
0.131 J	8.08	0.127		1.84	9.65	1.4	4	424	421	7.43		0.067		
0.134 J	7.71	0.129		1.91	8.89	1.3	2.6	426	423	7.4		0.059		
0.129 J	7.68	0.128		1.9	7.28	1.3	0.8	426	421	7.22		0.074		
0.122 J		0.123		1.94		1.2	2.6	424		7.34		0.055		
0.126 J	7.56	0.131		1.95	6.55	1.3	2.5	428	427.8	7.33		0.065		
0.128 J	7.82	0.126		1.93	10.75	1.5	1.6	423	421	7.9		0.057		
		7.76		0.09	1.66				372	8.2			0.1	
		7.56	0.114		1.93	4.28			395	7.77			0.099	
		7.56	0.112		1.83	5.4			417	8.32			0.12	
		7.52	0.093		1.65	5.68			395.2	9.52			0.114	
	0.155	7.64		0.125	1.85				369	7.46			0.067	
		7.84	0.083		1.58	8.1			399	7.87			0.077	
0.103 J	7.71	0.115		1.96	11.13	1.3	0.9	424	418	7.36		0.037		
0.109 J	7.51	0.118		1.97	6.99	1.1	1.1	426	418	7.43		0.048		
0.1105 J		0.116		1.99									0.057	
0.1 J	7.58	0.107		2.03	9.95	1.2	0.5 U	422	417	7.5		0.087		
0.107 J	7.55	0.114		2.03	8.56	1 U	1.3	423	416	7.19		0.043		
		7.8		0.072	2.66		1.3	0.5 U	473	422	4.16			0.01 U
		7.58	0.101		3.02		1.2	0.5 U	704	668	11		0.01 U	
		7.94	0.099		2.8		1.1 J	0.5 U	705	696	11.1		0.01 UJ	
		7.54	0.065		2.31	9	1.3 J	0.5 U	423	394.8	3.77		0.01 U	
		7.91	0.066		2.47		1 UJ	0.5 U	447	415	3.76		0.01 U	
0.052 J	7.42	0.0659		2.53	9.2	1	0.5 U	436	441	3.35		0.01 U		
0.083 J	7.23	0.0966		1.92	9.2	1 UJ	0.5 U	401	401.7	7.2		0.01 U		
0.095 J	7.27	0.109		2.07	9.4	1	0.5 U	434	434.3	9.19		0.01 U		
			0.047	3.27				622		5.16			0.013	
		7.58	0.038		2.32		1.6 J	0.5 U	543	534	4.42		0.01 UJ	
		7.52	0.039		3.32	9.42	1.6	0.5 U	593	552.6	5.87		0.01 U	
0.026 J		0.04		2.41		1.4	0.5 U	547		5.15		0.01 U		



## **Appendix C**

### **Key to Box Plots**



## Appendix C. Key to Box Plots

